

AL-TR-1991-0064

AD-A241 913



ARMSTRONG

RESULTS OF BORON, SURFACTANT, AND
CYANIDE INVESTIGATION
BEALE AFB CA

DTIC
ELECTE
OCT 21 1991
S B D

John G. Garland III, Major, USAF, BSC

OCCUPATIONAL AND ENVIRONMENTAL
HEALTH DIRECTORATE
Brooks Air Force Base, TX 78235-5000

LABORATORY

July 1991

Final Technical Report for Period February 1991 - March 1991

Approved for public release; distribution is unlimited.

91-13545

91-13545



AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235-5000

NOTICES

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

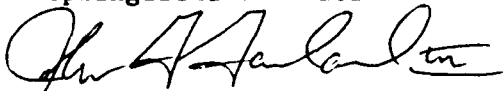
The mention of trade names or commercial products in this publication is for illustration purposes and does not constitute endorsement or recommendation for use by the United States Air Force.

The Office of Public Affairs has reviewed this report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This report has been reviewed and is approved for publication.

Government agencies and their contractors registered with Defense Technical Information Center (DTIC) should direct requests for copies to: DTIC, Cameron Station, Alexandria VA 22304-6145.

Non-Government agencies may purchase copies of this report from: National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield VA 22161.



JOHN G. GARLAND III, Maj, USAF, BSC
Chief, Environmental Engineering
Branch



EDWARD F. MAHER, Lt Col, USAF, BSC
Chief, Bioenvironmental Engineering
Division

REPORT DOCUMENTATION PAGE			Form Approved OMB No 0704-0188	
<small>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.</small>				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE July 1991	3. REPORT TYPE AND DATES COVERED Final February 1991 to March 1991	
4. TITLE AND SUBTITLE Results of Boron, Surfactant, and Cyanide Investigation Beale AFB CA			5. FUNDING NUMBERS	
6. AUTHOR(S) John G. Garland III				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Armstrong Laboratory Occupational and Environmental Health Directorate Brooks AFB, TX 78235-5000			8. PERFORMING ORGANIZATION REPORT NUMBER AL-TR-1991-0064	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) <p>The purpose of this field survey was to investigate wastewater treatment plant effluent levels for boron, methylene blue active substances (MBAS-surfactants), and total cyanide. Historical sampling data were insufficient to clarify whether Beale AFB exceeded their National Pollution Discharge Elimination System (NPDES) permit limitations. Up to 30 composite samples were taken of each contaminant. The results showed the base met boron permit limitations, exceeded the daily limit on one day for MBAS, and exceeded both the monthly average limitation and the daily limit for cyanide. Beale AFB has already taken numerous steps to eliminate contaminants from their discharges, e.g., increased sample data collection, product substitution, waste stream isolation and treatment, and split sampling. The report recommends the base systematically review past actions for areas that may have been overlooked or deemed too minor to address. Alternatively, the report recommends follow-up survey work by Armstrong Laboratory or an Armstrong Laboratory contractor.</p>				
14. SUBJECT TERMS total cyanide methylene blue active substances surfactants boron CWA NPDES			15. NUMBER OF PAGES 80	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

CONTENTS

	<u>Page</u>
ACKNOWLEDGMENTS.....	v
INTRODUCTION.....	1
DISCUSSION.....	1
Background.....	1
Materials and Methods.....	2
Results.....	5
CONCLUSIONS.....	13
RECOMMENDATIONS.....	14
REFERENCES.....	15
APPENDIX	
A Survey Request Message.....	17
B AFOEHL Consultative Letter (Survey Proposal) and Beale AFB Reply.....	19
C Tentative Amended Cease and Desist Order, 1 Oct 90.....	27
D Tentative Sewage Treatment Plant NPDES Permit, 21 Feb 91.....	37



Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

List of Tables

<u>Table No.</u>		<u>Page</u>
1.	Discharge Limitations.....	2
2.	Quality Assurance and Quality Control Sample Types...	5
3.	Methylene Blue Active Substances (MBAS) Sample Data.....	5
4.	MBAS QA/QC Results.....	6
5.	Boron Sample Data.....	7
6.	Boron QA/QC Results.....	9
7.	Cyanide Sample Data.....	10
8.	Cyanide QA/QC Results.....	12

List of Figures

<u>Fig. No.</u>		
1.	Sampling Site.....	3
2.	Plot of MBAS Data Versus Weekday.....	6
3.	Plot of Boron Data Versus Weekday.....	8
4.	Plot of Boron Frequency Data.....	9
5.	Plot of Cyanide Data Versus Weekday.....	11
6.	Plot of Cyanide Frequency Data.....	12

ACKNOWLEDGMENTS

Key personnel contributing to the survey included the survey NCOIC, TSgt Mary Fields, and the base support technician, A1C Valerie Brown. Other essential support came from Capt Chris Sherman, OIC, Bioenvironmental Engineering; Sgt Marc Mason, Bioenvironmental Engineering Services technician; Mr Duryl Bird, Analytical Services; Mr Gil Valdez, Quality Assurance Branch; and Mr Leo Rodriguez, Contract Management.

RESULTS OF BORON, SURFACTANT, AND CYANIDE INVESTIGATION, BEALE AFB, CA

INTRODUCTION

Historical data were insufficient to clarify whether Beale AFB exceeded their discharge limits for boron, total cyanide, and surfactants. To obtain more definitive data, the base requested the Occupational and Environmental Health Directorate, Armstrong Laboratory (formerly the Air Force Occupational and Environmental Health Laboratory) assistance (Appendix A). The Armstrong Laboratory Water Quality Function and the Beale AFB Civil and Bioenvironmental Engineering personnel reached agreement on the additional analytical requirements in Jan 91 (Appendix B). Armstrong Laboratory conducted a joint survey with the 814th Strategic Hospital Bioenvironmental Engineering Services from 7 Feb 91 to 9 Mar 91. The Armstrong Laboratory team included Maj John G. Garland III and TSgt Mary M. Fields. The base team member was ALC Valerie E. Brown.

DISCUSSION

Background

General

Beale AFB supports the 14th Air Division, the 9th Strategic Reconnaissance Wing, the 7th Missile Warning Squadron, and the 1883D Communications Squadron. These units provide operation and maintenance support for U2, KC135, and T38 aircraft, and facility support for a PAVE PAWS radar site. Base operating support includes transportation, civil engineering, and medical organizations. The base encompasses approximately 23,000 acres in Yuba County, California.

The Tentative Amended Cease and Desist Order, 1 Oct 90 (Appendix C) shows that from 1986 to 1988 Beale AFB exceeded its boron and total cyanide effluent limitations. The base also violated its foam limitations.

Beale AFB and the USAF took a variety of steps to mitigate high effluent levels from 1986 to the present. These included the following:

- Increased monitoring and monthly reporting.
- A Sep 1988 Hazardous Waste and Wastewater Characterization survey by the AFOEHL. (USAFOEH Report, 89-003EQ0013ASC, Wastewater Characterization/Hazardous Waste Survey, Beale AFB CA)
- Source investigation of boron, cyanide, and surfactant contamination.
- Implementation of a product substitution program for products containing boron and cyanide.

- Isolating the Precision Photographic Laboratory waste stream from the sanitary system.
- Follow-up split sampling for cyanide and boron using two analytical laboratories.
- Commissioning an independent engineering consulting firm, Engineering Science, Inc., to evaluate the efficiency of the treatment plant and available alternatives to improve efficiency through operation, maintenance, training, or additional plant upgrades.

Permit Standards

Effective 21 Mar 91, the base discharge is governed by Waste Discharge Requirements order No. CA0110299. The tentative permit is shown in Appendix D.

The discharge limitations for cyanide, boron, and surfactants are shown in Table 1.

Table 1. DISCHARGE LIMITATIONS

<u>Constituent</u>	<u>Units</u>	<u>30-Day Avg.</u>	<u>Daily Max.</u>
MBAS	mg/l	0.5	1.0
Boron	mg/l	1.0	2.0
Total Cyanide	mg/l	0.005	01

Materials and Methods

Sample Collection

The team collected all samples at the top of the cascade steps leading into Hutchinson Creek (Figure 1). Samples were 24-hour, non-flow-proportional, composite samples. The team collected the samples using an ISCO, Model 2910 sampler. The team packed the ISCO collection jar in ice daily to maintain a lower sample temperature. Temperature, pH, and free available chlorine were measured daily.

Immediately following collection, the team preserved the samples as required by Standard Methods and placed them in a refrigerator at approximately 4°C until shipping (1). The team shipped the samples in ice-packed coolers by Federal Express using chain-of-custody procedures to Data Chem in Salt Lake City Utah. Data Chem is a California and EPA-certified laboratory.

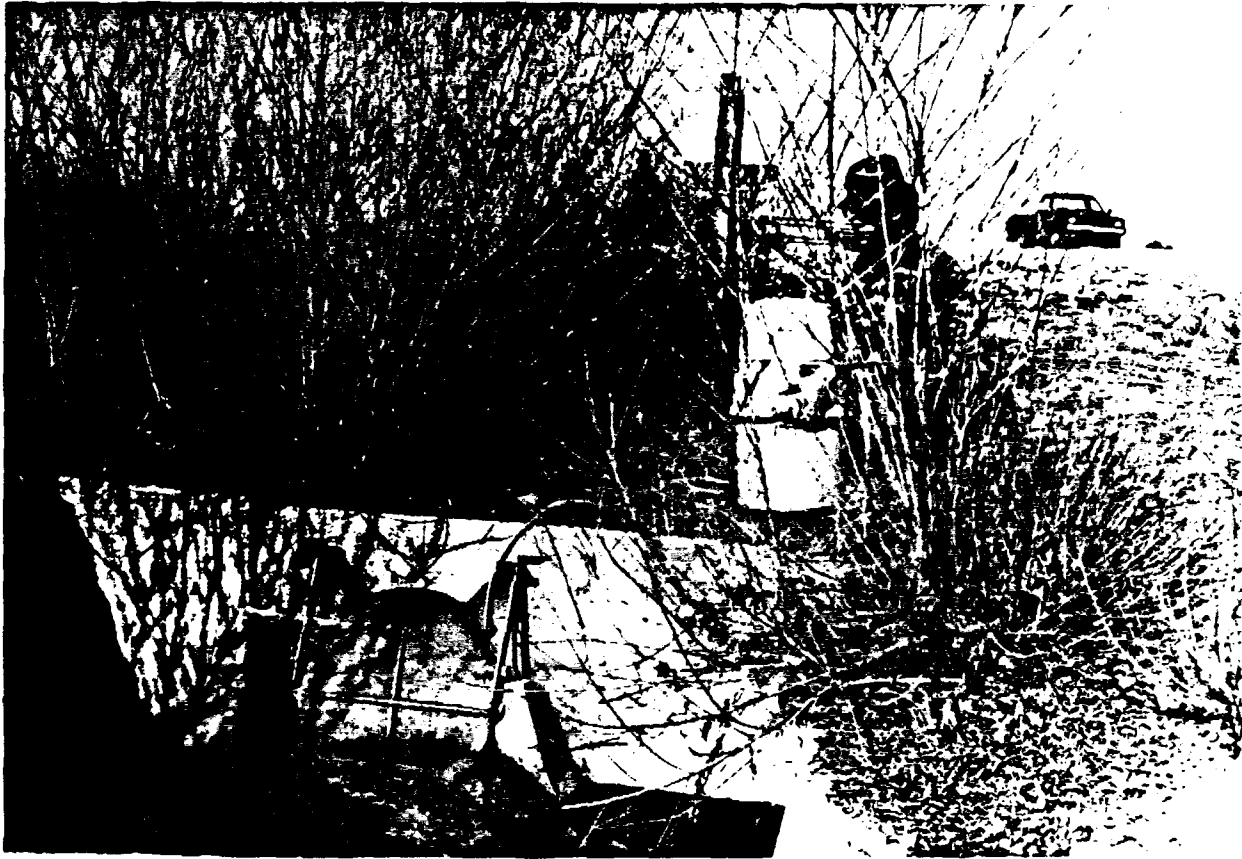


Figure 1. Sampling Site

Analytical Method

Methylene Blue Active Substances (MBAS). The team and support laboratory analyzed surfactants following EPA method 425.1 (Standard Methods 512A) (1). Data Chem analyzed samples within 48 hours of collection. This method is approved by EPA (40 CFR Part 136) and subparagraph C, Provisions for Monitoring, in the base's NPDES Permit (2). Method 425.1 is a colorimetric method applicable to the measurement of MBAS substances in domestic waste. The method is applicable in the range of 0.025 to 100 mg/l linear alkyl sulfonate.

Boron. The team analyzed boron using inductively coupled plasma (ICP) method 200.7 from 40 CFR Part 136. Samples were preserved with nitric acid to pH 2. Data Chem analyzed boron samples within 30 days of collection. The estimated detection limit for boron using ICP is 5 µg/liter with an upper limit concentration of 50 mg/l (1). The single analyst standard deviation according to Standard Methods is described by the following equation for a range of 19 to 5189 µg/l (1):

$$X = 0.8807C + 9.0 \text{ (Where C is the true value in } \mu\text{g/l.)}$$

$$SR = 0.0742X + 23.2 \text{ (Total digestion in } \mu\text{g/l, where X = mean recovery.)}$$

SR = single-analyst standard deviation, µg/l.

Cyanide. The team analyzed total cyanide using EPA method 335.3 colorimetric automated UV (1). This method is approved by EPA (2) and subparagraph C, Provisions for Monitoring, in the base's NPDES Permit. It is applicable to domestic waste in the range of from 5 to 500 µg/l. The team checked each sample for oxidizing agents like chlorine and preserved the samples IAW Table II, 40 CFR Part 136. This required checking the samples for oxidizing agents with potassium iodide-starch paper which had been moistened in acetate buffer solution. The team also checked each sample for sulfides using lead acetate test paper. A single drop of 0.10N sodium thiosulfate was added to cyanide samples IAW the Standard Methods description of preliminary treatment of samples, part 412A (1). Samples were then preserved to pH 12-12.5 with sodium hydroxide pellets. Data Chem analyzed samples within 14 days of collection. Standard Methods relates the analysis of a mixed cyanide solution containing sodium, zinc, copper, and silver cyanides in tap water gave a precision within the designated range as follows:

$$S_T = 0.115X + 0.031$$

where

S_T = overall precision and

X = CN- concentration, mg/L (1)

Quality Assurance and Quality Control (QA/QC)

The team followed the recommendations from Standard Methods for the number and type of field QA/QC samples. Blank samples included a field blank sample, reagent blanks, and equipment blanks. The field blank was a deionized, distilled water solution transferred from one container to another at the sampling site. The reagent blanks were deionized, distilled water to which the preservation reagent, e.g., nitric acid, had been added. Equipment blanks were deionized, distilled water sucked through the automatic sampler then preserved with the appropriate reagent. Duplicate samples were prepared by taking sample aliquots from the well-mixed ISCO composite sample. The team prepared spike samples on-site using EPA stock reagents. The concentration of the spike samples was 0.5 mg/l for MBAS, 1.5 mg/l for boron, and 0.01 mg/l for total cyanide. The number of QA/QC samples of each type are shown in Table 2.

Table 2. QUALITY ASSURANCE AND QUALITY CONTROL SAMPLE TYPES

	<u>Boron</u>	<u>Cyanide</u>	<u>MBAS</u>
Field Blank	1	1	0
Equipment Blank	2	1	1
Reagent Blank	1	1	1
Duplicate Pairs	5	6	3
Spike	3	4	2

The QA/QC samples were double-blind QA/QC samples for the support laboratory; Data Chem received all field QA/QC samples labeled and numbered the same as the actual samples.

In addition to field QA/QC, Data Chem has an analytical quality control program accepted by EPA and reviewed and approved by Armstrong Laboratory, and they follow the QA/QC recommendations in each EPA standard method.

Results

MBAS

Table 3 lists the analytical results. The sample collection was the day the team collected and fixed the sample. The weekday is the day the sample represents, i.e., the day prior to the sample collection day. For example, sample CN910-107 was a composite sample covering the period from Sunday 10 Feb at 0900 to Monday 11 Feb at 0900. Figure 2 displays the MBAS sample data plotted versus the day of the week (Mon-1, Tue-2, etc.) and shows the daily maximum and 30-day average maximums required by the base's permit. Sample numbers beginning with CN910 were taken during this study. Samples beginning with the sample number CN900 were collected in the past by the base. Table 4 summarizes the QA/QC results for MBAS.

Table 3. METHYLENE BLUE ACTIVE SUBSTANCES (MBAS) SAMPLE DATA

<u>Sample No.</u>	<u>Result(mg/l)</u>	<u>Collection</u>	<u>Weekday</u>
<u>CN910-</u>		<u>Sample Date</u>	
107	0.3	Feb 11	Sun
123	0.2	Feb 19	Mon
125	0.2	Feb 20	Tue
131	0.4	Feb 25	Sun
140	0.9	Mar 4	Sun
141	1.1	Mar 5	Mon
142	0.5	Mar 6	Tue
146	0.4	Mar 10	Sat
<u>CN900-</u>			
216	0.4		
291	0.7		
320	0.2		
359	0.3		
495	0.5		

Beale AFB MBAS

Between 11 Feb & 9 Mar 91

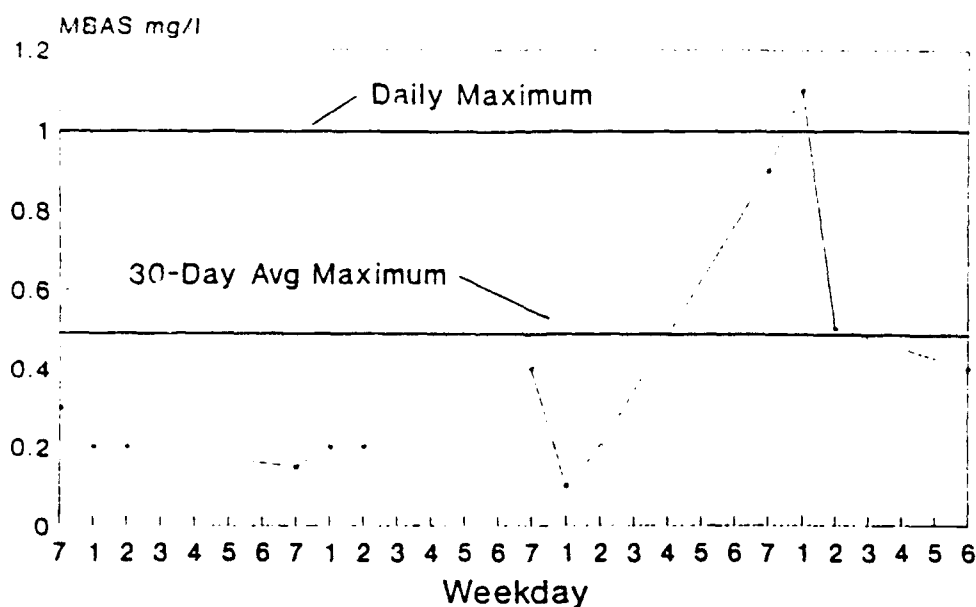


Figure 2. Plot of MBAS Data Versus Weekday

Table 4. MBAS QA/QC RESULTS

Sample Number	Type QA/QC	Result(mg/l)	Pair Number	Pair Result(mg/l)	Delta
108	Duplicate	0.2	107	0.3	0.1
113	Duplicate	0.1	112	0.2	0.1
124	Duplicate	0.2	123	0.2	0.0
				<u>Spike(mg/l)</u>	
109	Spike	0.6	N/A	0.5	+0.1
114	Spike	0.4	N/A	0.5	-0.1
110	Reagent Blank	<0.1			
111	Equipment Blank	<0.1			

Boron

Table 5 lists the analytical data as explained under MBAS. Figure 3 displays the data by weekday (1-Mon, 2-Tue, etc.) and shows the 30-day average maximum and daily maximum permit limits. Figure 4 plots frequency distribution of the data. None-detected values were assigned a value of one-half of the equipment detection limit. Table 6 summarizes the QA/QC results for boron.

Table 5. BORON SAMPLE DATA

Boron			
<u>Sample Nbr</u> <u>CN910-</u>	<u>Result(mg/l)</u>	<u>Collection</u> <u>Sample Date</u>	<u>Weekday</u>
101	<.2	Feb 8	Thu
105	<.2	Feb 9	Fri
106	<.2	Feb 10	Sat
107	<.2	Feb 11	Sun
112	0.20	Feb 12	Mon
115	0.21	Feb 13	Tue
116	0.20	Feb 14	Wed
117	0.22	Feb 15	Thu
118	0.25	Feb 16	Fri
119	0.28	Feb 17	Sat
120	0.29	Feb 18	Sun
123	0.31	Feb 19	Mon
125	0.31	Feb 20	Tue
126	0.28	Feb 21	Wed
127	0.32	Feb 22	Thu
128	0.31	Feb 23	Fri
130	0.30	Feb 24	Sat
131	0.31	Feb 25	Sun
132	0.32	Feb 26	Mon
133	0.31	Feb 27	Tue
135	0.31	Feb 28	Wed
137	0.30	Mar 1	Thu

Beale AFB Boron

8 Feb to 1 Mar 91

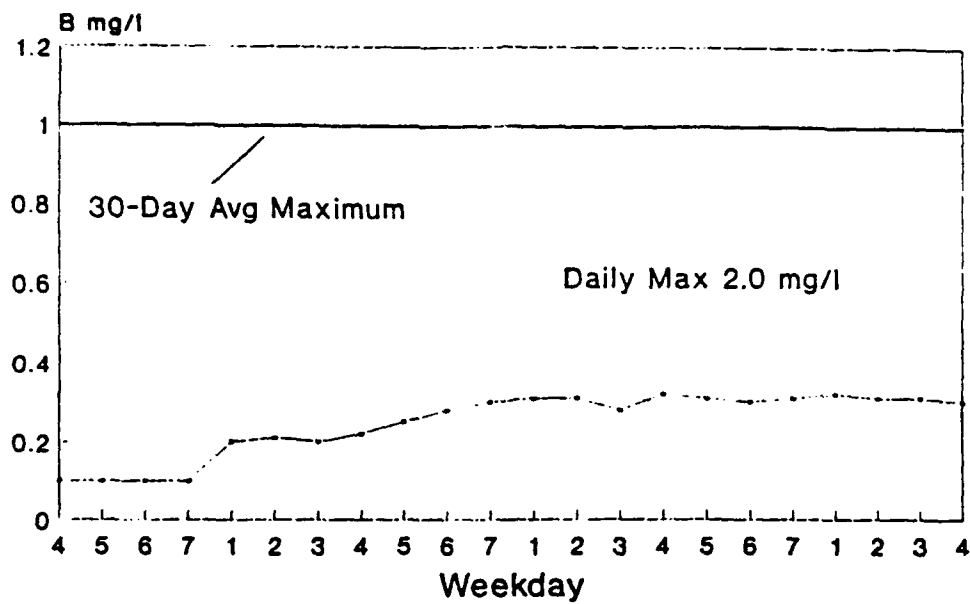


Figure 3. Plot of Boron Data Versus Weekday

Beale AFB Boron Frequency Distribution

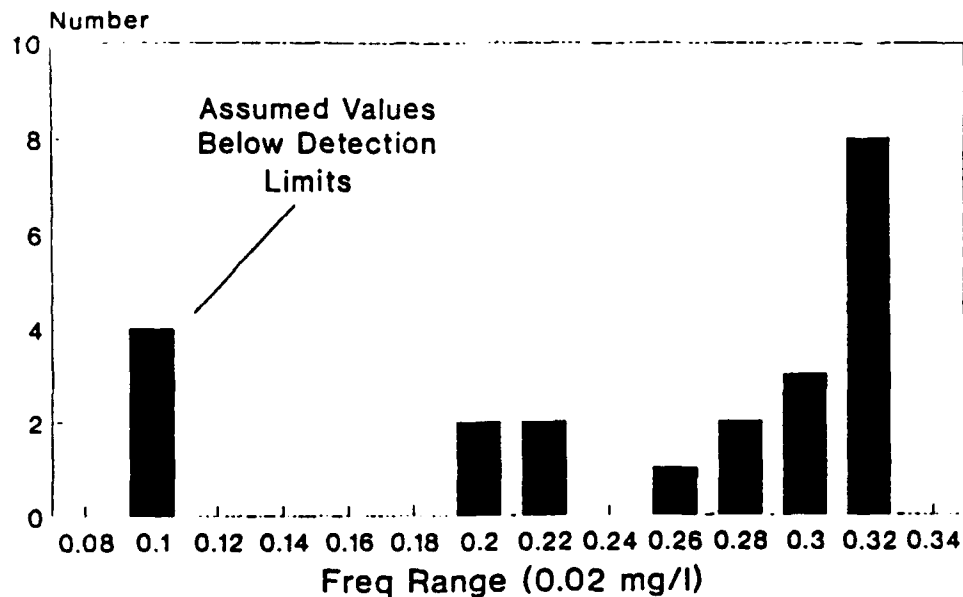


Figure 4. Plot of Boron Frequency Data

Table 6. BORON QA/QC RESULTS

Sample Number	Type QA/QC	Result(mg/l)	Pair Number	Pair Result(mg/l)	Delta
102	Duplicate	<0.2	101	<0.2	0.00
113	Duplicate	0.20	112	0.20	0.00
121	Duplicate	0.29	123	0.30	0.01
129	Duplicate	0.32	128	0.31	0.01
134	Duplicate	0.30	133	0.31	0.01
				<u>Spike(mg/l)</u>	
103	Spike	1.5	N/A	1.5	0.0
114	Spike	1.5	N/A	1.5	0.0
122	Spike	1.5	N/A	1.5	0.0
104	Reagent Blank	<0.2			
111	Equipment Blank	<0.2			
100	Equipment Blank	<0.2			

Cyanide

Table 7 lists the analytical data as explained under MBAS. Figure 5 displays the data by weekday (1-Mon, 2-Tue, etc.) and shows the 30-day average maximum and daily maximum permit limits. Figure 6 plots frequency distribution of the data. None-detected values were assigned a value of one-half of the equipment detection limit. Table 8 summarizes the QA/QC results for cyanide.

Table 7. CYANIDE SAMPLE DATA

<u>Sample Number</u>	<u>Result(mg/l)</u>	<u>Collection</u> <u>Sample Date</u>	<u>Weekday</u>
CN910-			
101	0.011	Feb 8	Thu
105	0.010	Feb 9	Fri
106	0.010	Feb 10	Sat
107	0.010	Feb 11	Sun
112	0.008	Feb 12	Mon
115	0.008	Feb 13	Tue
116	0.008	Feb 14	Wed
117	0.006	Feb 15	Thu
118	0.007	Feb 16	Fri
119	0.007	Feb 17	Sat
120	0.029	Feb 18	Sun
123	N.D.	Feb 19	Mon
125	N.D.	Feb 20	Tue
126	0.007	Feb 21	Wed
127	0.007	Feb 22	Thu
128	0.007	Feb 23	Fri
130	0.006	Feb 24	Sat
131	0.006	Feb 25	Sun
132	0.006	Feb 26	Mon
133	0.007	Feb 27	Tue
135	N.D.	Feb 28	Wed
137	N.D.	Mar 1	Thu
138	0.006	Mar 2	Fri
139	0.008	Mar 3	Sat
140	0.006	Mar 4	Sun
141	0.006	Mar 5	Mon
142	0.007	Mar 6	Tue
143	0.007	Mar 7	Wed
144	0.008	Mar 8	Thu
145	0.005	Mar 9	Fri
146	N.D.	Mar 10	Sat

Beale AFB Total Cyanide

8 Feb to 10 Mar 91

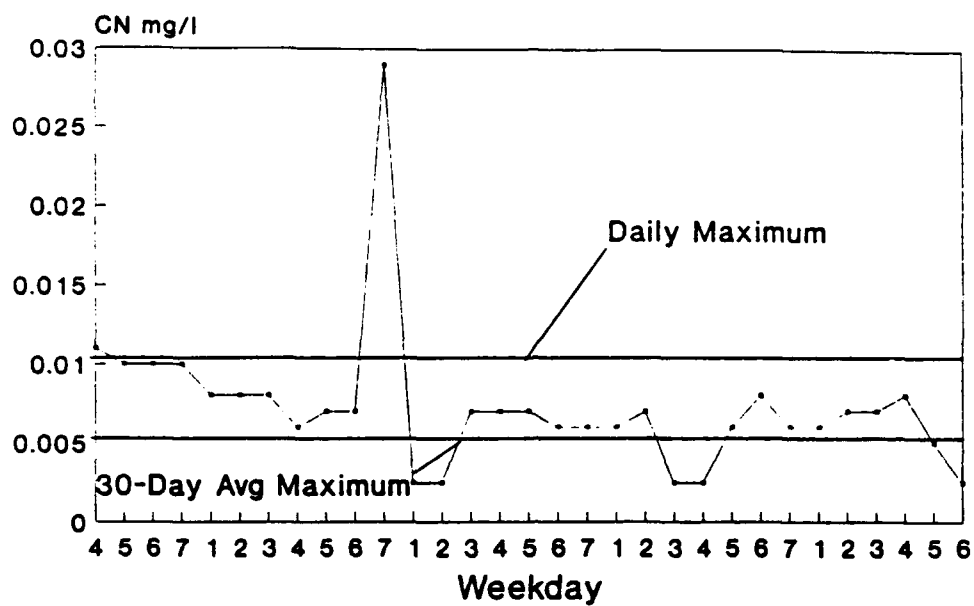


Figure 5. Plot of Cyanide Data Versus Weekday

Beale AFB Total Cyanide Frequency Distribution

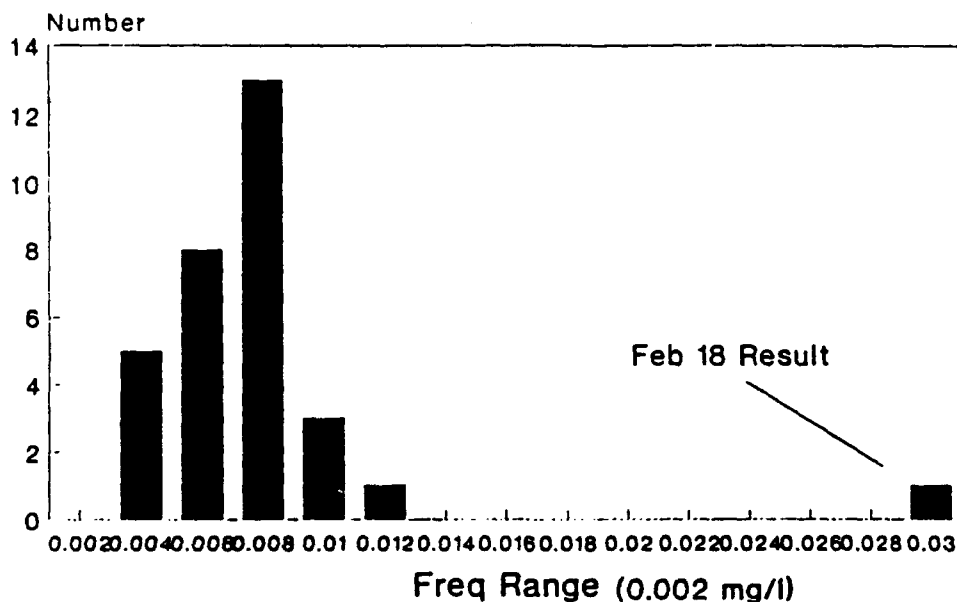


Figure 6. Plot of Cyanide Frequency Data

Table 8. CYANIDE QA/QC RESULTS

Sample Number	Type QA/QC	Result(mg/l)	Pair Number	Pair Result(mg/l)	Delta
102	Duplicate	0.010	101	0.011	0.001
121	Duplicate	0.016	120	0.029	0.013
129	Duplicate	0.007	128	0.007	0.000
134	Duplicate	0.007	133	0.007	0.000
103	Spike	0.067	N/A	<u>Spike(mg/l)</u> 0.01	-0.033
114	Spike	0.074	N/A	0.01	-0.026
122	Spike	0.059	N/A	0.01	-0.041
136	Spike	0.092	N/A	0.01	-0.008
104	Reagent Blank	<0.005			
111	Equipment Blank	<0.005			
100	Field Blank	<0.005			

CONCLUSIONS

MBAS

The raw data analyses of MBAS shows the base to be at the 0.5 mg/l 30-day average limit for MBAS, but to have exceeded the daily maximum on a single day by 0.1 mg/l (\bar{x} =0.5 mg/l, s =0.3295, range 0.2 mg/l-1.1 mg/l). Considering all 13 analyses, the average is 0.47 mg/l and the standard deviation is 0.2780.

The quality assurance data from the two duplicate pairs indicate there could be some positive bias in the data. With the detection limit reported as 0.1 mg/l and a single significant digit of accuracy, the 1.1 mg/l result could be partially caused by data rounding and positive bias rather than a true value above the 1.0 mg/l standard.

Boron

The 18 boron data analyses points showed an average boron level of 0.28 mg/l and a standard deviation of 0.0432. The range was 0.2 mg/l to 0.32 mg/l. The QA/QC show the precision and accuracy of the data to be excellent. This data shows the base to be meeting the 30-day average and daily maximum levels for boron.

Cyanide

The raw data, assuming a none-detect value of one-half of the analytical detection limit, for the 31 analyses for cyanide show an average total cyanide level of 0.0073 mg/l. The standard deviation of the data is 0.0046. The range is from no detectable cyanide (<0.005 mg/l) to 0.029 mg/l.

Three of the four duplicate QA/QC samples showed fairly high precision. Two pairs, 129-128 and 134-133, showed no difference in the duplicates. Pair 102-101 showed a range of 9.52%. Pair 121-120 showed a range of 58%. The 121-120 pair create concern; particularly sample 120 of 0.029 mg/l is problematic. It is almost twice the value reported for its duplicate and clearly a data outlier, over 4.7 standard deviations from the mean. It is also inconsistent with the composite sampling taken the day before and the day after. Samples before and after the 0.029 mg/l day are 0.007 mg/l and <0.005 mg/l respectively. The mixing and short-circuiting that occur naturally in any wastewater treatment plant make it unlikely that 0.029 mg/l actually occurred. Our conclusion is that the 0.029 mg/l value represents an analytical error, not a spike of cyanide contamination in the field.

None-detected results indicate there was no interference consistently present which may have been caused by the sample collection and preservation protocol, or the analytical technique.

Even under the most favorable circumstances, i.e., ignoring the 0.029 mg/l value and assuming none-detected values are 0.00 mg/l, the average 30-day cyanide value is 0.0061 mg/l in excess of the permissible level.

RECOMMENDATIONS

The scope of this survey, as originally envisioned, was to provide the base with documentation showing effluent levels of MBAS, boron, and cyanide met permit guidelines. The data, however, show the base meets the boron limits, may not meet the standard for MBAS, and probably does not meet the standard for cyanide.

The base is unable to meet the cyanide 30-day average in spite of a dedicated and far-reaching effort to identify and eliminate sources of cyanide contamination. The state standard for the base is essentially to have no detectable total cyanide since it requires an average of 0.005 mg/l and the detection limit is 0.005 mg/l. This is a very stringent standard and appears to be derived directly from the baseline EPA Water Quality Criteria. However, these criteria were intended to present scientific data and guidance of the environmental effects of pollutants which could be used to derive regulatory requirements based on considerations of water quality impacts. We would recommend the base initiate a discussion with the regulators on the impact the cyanide in the base's effluent is having on Hutchinson Creek. The base should check upstream cyanide levels in the creek. Levels in excess of 0.005 mg/l may support an argument that less stringent permit levels would not affect the creek's animal and plant life species. Armstrong Laboratory can conduct species diversity studies.

We know of no new course of action the base can take with respect to cyanide contamination at this time. Our primary recommendation is the base review the steps already taken and search for areas that may have been overlooked or deemed too minor to address in their initial efforts. This should include a review of the chemical use and disposal in key areas known to typically generate cyanide waste. These areas include the maintenance area nondestructive inspection function, the hospital, photo hobby (if still in operation), corrosion control, pest management, and pavements and grounds. The base should also reexamine the disinfectants the base uses in their air conditioning systems, as some are still made with cyanide-containing products. The base should also analyze their drinking water for cyanide (the proposed maximum contaminant level for drinking water is 200 µg/l).

The base should be able to achieve lower surfactant effluent levels by controlling surfactants at their source, either from domestic use in the base housing area or from flightline maintenance areas.

We will continue to examine the available data and work with you on how we can identify and eliminate the source of cyanide. It might be appropriate to complement the data collected in the AFOEHL 1988 on-site survey with a follow-up survey either using in-house resources or a contractor. The follow-up survey would be a base-wide survey using primarily grab samples to allow better correlation between process activity and the wastestream data.

REFERENCES

1. APHA, Standard Methods for the Examination of Water and Wastewater, 16th Ed., American Public Health Association, Washington DC, 1985.
2. Code of Federal Regulations, Title 40, Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act (1984).

APPENDIX A
Survey Request Message

13G 0 TIME RAJY
23338 2217 225/90

EQR

RET MSG 0
00927

ROUTINE

57048G/CC AC DE DP HC IN JA LB MU SL SP SS SV XP AFCON AFDTL AFHRL AFGEHL
SD/CE AP CI CMS CS CV EV IN PA PK SC SD SE XA XR (A) AFOMS AFOSI 2199 4575
X CLINIC COMSEC DET-20 DET-2L OLMT OL-SH PLA USAFSAM 69CL 8075

ATUZYUW RHVUDDAD133 2252214-UJUU--RUVKBRK

NR 00000

142200Z AUG 90

UCJAA/HQ SAC OFFUTT AFB NE//SG/SGP/SGPB//
RNDJSA/AFSC ANDREWS AFB MD//SGP//
UJKBK/HQ HSD BROOKS AFB
UCJAA/HQ SAC OFFUTT AFB NE//DE/DEV//

UNCLAS

DDO

IN JUN 88, BEALE AFB RECEIVED A STATE OF CALIFORNIA (CRWCCB) IMPOSED CEASE AND DESIST ORDER FOR EXCEEDING NPDES DISCHARGE LIMITS OF BORON, CYANIDE AND SURFACTANTS. GEHL CONDUCTED A WASTEWATER/HAZARDOUS WASTE SURVEY (REPORT DATED JAN 89) TO IDENTIFY CAUSES OF THE VIOLATING CONDITIONS.

WE HAVE IMPLEMENTED THE REPORT RECOMMENDATIONS AND ALSO INSTALLED A \$100K PHOTOWASTE PRE-TREATMENT UNIT. DESPITE THIS, THE PROBLEMS OF BORON, CYANIDE, AND FOAMING PERSIST.

PAGE 02 RHVUDDAD133 UNCLAS

ALTHOUGH THE C&D COMPLIANCE DATE OF 15 JUN 89 HAS PASSED, THE CRWCCB HAS YET TO ENFORCE THE ORDER DUE TO OUR GOOD FAITH EFFORTS TO COMPLY. HOWEVER WE JUDGE OUR VULNERABILITY TO FURTHER ENFORCEMENT ACTION (FINES, PENALTIES) TO BE UNACCEPTABLY HIGH.

REQUEST YOU FORM ANOTHER TEAM FOR FURTHER WORK AT BEALE TO IDENTIFY AND ISOLATE THE VIOLATING CONDITIONS. WE MUST GET THIS PROBLEM SOLVED VERY SOON OR FACE SERIOUS DIFFICULTY WITH THE REGULATORS.

PLEASE SCHEDULE US FOR TESTING AT YOUR EARLIEST AVAILABLE DATE. WE DO NOT FEEL THAT AN A/E CONTRACTOR IS A VIABLE OPTION AT THIS TIME DUE TO RAPIDLY CHANGING COMPLIANCE STRATEGY FOR THE SEWAGE TREATMENT PLANT.

THIS IS A JOINT MESSAGE FROM 814 CES/DEV AND 814 SH/SGPB. POC IS MR GREG MILLER 814 CES/DEV AV 368-4591.

BT
00133 NNNH

APPENDIX B
AFOEHL Consultative Letter (Survey Proposal)
and Beale AFB Reply



DEPARTMENT OF THE AIR FORCE
AIR FORCE OCCUPATIONAL AND ENVIRONMENTAL HEALTH LABORATORY (AFSC)
BROOKS AIR FORCE BASE, TEXAS 78235-3501

REPORT TO
ATTN OF

EQW (Maj Garland, DSN 240-3305)

30 NOV 1990

SUBJECT Consultative Letter, 90-206EQ00013LEF, Recommendations for Sampling Treatment Plant Effluent, Beale AFB CA

TO 9th Strat Hosp/SGPB
9th CES/DE
IN TURN

1. Historical sampling data do not clarify whether Beale AFB CA exceeds the discharge limitations for boron, total cyanide, and surfactants. The 9th CSG/CC received a Cease and Desist Order on 20 May 88 and an amended Cease and Desist order in 1990 directing the base to stop discharge of the contaminants in excess of the permit limits. In a 14 Aug 90 message, base civil engineering personnel, through medical channels, requested the Air Force Occupational and Environmental Health Laboratory (AFOEHL) conduct a field survey. Subsequent to their message, base personnel requested AFOEHL delay the survey pending the outcome of on-going analytical tests. Maj Garland conducted a presurvey from 22-24 Oct 90 to review data and discuss details of what AFOEHL might provide during a field survey. DEV, SGPB, and AFOEHL agreed that past data do not show whether the base is complying with their permit. In addition, the 9th RTS Precision Photography Laboratory recently stopped all sanitary system discharges thereby eliminating a significant source of contamination from the sanitary system and making much of the historical sampling data obsolete. The base asked AFOEHL to propose a sample plan which will show whether they are complying with their discharge permit under the new conditions. This consult letter contains that plan.

2. Literature Reviewed

Standard Methods for the Examination of Water and Wastewater, 17th Ed
Washington D.D. APHA, AWWA and WPCF (1989)

EPA Methods for Chemical Analysis of Water and Waste, EPA 600/4-79-020,
(revised Mar 83)

3. Results:

a. Relevant Permit Requirements. The present permit prohibits the discharge of an effluent in excess of the following:

<u>Constituent</u>	<u>Units</u>	<u>30 Day Average</u>	<u>Daily Maximum</u>
Boron	mg/l	1.0	2.0
Total Cyanide	mg/l	0.0035	0.007

The renewed permit which will be in effect in late 1990 will contain the limits above and will limit surfactants as measured by methylene blue active substances (MBAS) to 1 mg/l.

11-10-90 X 10-10-90

b. Effluent Data.

(1) Cyanide. Cyanide data measured at the treatment plant effluent was as follows:

<u>Number</u>	<u>Sample ID</u> <u>CN 900-</u>	<u>Concentration</u> <u>mg/l</u>	<u>Remarks</u>
1	214	0.020	
2	241	0.068	
3	271	0.100	
4	292	0.152	
5	357	0.100	
6	434	0.109	
7	433	<0.005	Sodium thiosulfate added
8	432	0.153	
9	431	<0.005	Sodium thiosulfate added
10	470	<0.005	Sodium thiosulfate added
11	467	<0.005	Sodium thiosulfate added
12	462	<0.005	Sodium thiosulfate added
13	483	<0.005	Sodium thiosulfate added
14	Unk	0.148	
15	545	<0.005	Sodium thiosulfate added

(2) Boron. Boron data measured at the treatment plant effluent was as follows:

<u>Number</u>	<u>Sample ID</u> <u>CN 900-</u>	<u>Concentration</u> <u>mg/l</u>
1	215	2.70
2	242	2.35
3	272	2.40
4	290	1.85
5	319	2.00
6	358	2.80
7	406	2.60
8	471	3.70

(3) Surfactants. Surfactant data measured at the treatment plant effluent was as follows:

<u>Number</u>	<u>Sample ID</u> <u>CN 900-</u>	<u>Concentration</u> <u>mg/l</u>
1	216	0.4
2	291	0.7
3	320	0.2
4	359	0.3
5	495	0.5

c. Quality Assurance and Quality Control. Standard Methods recommends where duplicate samples are being analyzed that the sum of the duplicates and known additions should be 10% of the total number of samples. Five percent of

the sample load should be reagent blanks. Ten percent of the samples should be spike samples.

4. Conclusions:

a. Cyanide

(1) Confidence in Present Data. The cyanide data is questionable because of analytical problems as well as because of the baseline change in cyanide contamination. All the samples shown above probably contained chlorine since the effluent to the treatment plant is chlorinated. Chlorine is an interfering chemical in the analysis of total cyanide. Recommended sampling procedures for cyanide include adding either 0.6 grams ascorbic acid or 0.1 grams sodium thiosulfate per liter to remove residual chlorine. Consequently those samples not properly preserved could show false positive interference from chlorine. Samples preserved with too much sodium thiosulfate would not cause a false negative result.

(2) Additional Sampling Requirements. Because there is no meaningful historical data, it is difficult to make reasonable assumptions about future data.

Standard Methods recommends using the following relationship to establish the required number of samples:

$$N \geq (ts/U)^2$$

where:

- N = number of samples
- t = Student-t statistic for a given confidence level
- s = overall standard deviation, and
- U = acceptable level of uncertainty

If we assume the data may range from 0 mg/l to 0.035 mg/l. The standard deviation would be 0.006 mg/l. Assuming an acceptable level of uncertainty U of ± 0.003 mg/l

$$\begin{aligned}s &= 0.006 \\ U &= 0.003 \\ s/U &= 2.0\end{aligned}$$

Given the assumptions above, the Standard Methods approach would require approximately 30 samples to be 95% confident (Graphical Interpretation of Fig 1060:1).

(3) Collection and Preservation of Samples. Sampling personnel should perform the following:

(a) Maintain composited samples at 4°C.

(b) Test for sulfide with lead acetate test paper moistened with acetic acid buffer solution, pH 4.

-- Remove sulfide with powdered lead carbonate if necessary and repeat step 2.

-- Filter with Wattman 40 filter paper to remove precipitant.

(c) Preserve with 100 mg sodium thiosulfate per liter.

(d) Collect 1 liter in glass or polyethylene container.

(e) Add NaOH to pH>12.

(f) Refrigerate in the dark.

(g) Analyze within 24 hours if sulfide is present or 14 days if sulfide is not present.

b. Boron

(1) Confidence in Present Data. There appear to be no analytical problems with the boron data. However, as mentioned above, since the data was taken, the Beale AFB wastewater treatment plant has stopped the addition of industrial waste from the 9th RTS Precision Photography Laboratory. The 9th RTS wastewater did contain boron and consequently, we should expect future effluent boron levels to be lower than historical levels.

(2) Additional Sampling Requirements. Using the Standard Methods approach described previously for cyanide, it is possible to calculate that approximately 30 total samples would be required to obtain 95% confidence in boron data which ranged from 0.0 mg/l to 3.7 mg/l

$$\begin{aligned}s &= 0.6167 \\ U &= \pm 0.2 \text{ mg/l} \\ s/U &\approx 3\end{aligned}$$

Graphical interpretation of Fig 1060:1 shows 30 samples.

(3) Collection and Preservation of Samples. Samples must be collected in alkali-resistant, boron-free glassware or polyethylene bottles. Sample size is 250 ml. Samples should be analyzed within 28 days.

c. Surfactants

(1) Confidence in Present Data. The effluent levels of surfactants may only be slightly influenced by the elimination of the 9th RTS photolaboratory wastestream. An evaluation of the existing data showed the following:

Standard Deviation - $s = 0.192$
Mean value - $\bar{x} = 0.42$

The probability of occurrence of the standard, 1.0 mg/l, or higher in future samples can be predicted from the existing data using student's t distribution as follows:

$$t = (y - x)/s = (1.0 - 0.42)/0.192 = 3.0$$

$$\Pr(t > 3.0) \approx 0.21 = 21\%$$

(2) Additional Sampling Requirements. Using the Standard Methods approach described above, it is possible to calculate that approximately 18 total samples would be required to obtain 95% confidence in the data.

$$s = 0.1924$$

$$U = \pm 0.1 \text{ mg/l}$$

$$s/U \approx 2.0$$

Graphical interpretation of Fig 1060:1 shows 18 samples.

(3) Collection and Preservation of Samples. Collect 1 liter in polyethylene or glass containers. Cool to 4°C and analyze within 48 hours.

5. Recommendations:

a. We recommend 94 additional samples be taken IAW Standard Methods.

Parameter	Additional Samples	Duplicate Samples ¹	Spike Samples ²	Reagent Blank Samples ³	Field Blank Samples ⁴	Cost ⁵
Total Cyanide ⁶	30	6	3	2	1	\$530
Boron	22	5	3	1	1	\$1,429
MBAS(Surfactant)	13	3	2	1	1	\$443
Total:	65	14	8	4	3	\$2,402

Notes: 1. Duplicate samples are 20% of the required additional samples.

2. Spike samples are 10% of the additional samples and will be prepared IAW Standard Methods procedures for preparing calibration standards for the applicable test.

3. The number of reagent blank samples is the minimum. The sampling team should submit a reagent blank whenever they use new sampling containers or preservation chemicals.

4. Create one field blank with distilled water for each significant field trip and type sampling operation, e.g., grab vs composite.

5. Analytical cost. There is no analytical cost to the base if the AFOEHL contract laboratory performs the analytical work.

6. Using EPA method 335.3 for cyanide, 425.1 for MBAS, and 200.7 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes for Boron.

b. We recommend samples be 24-hour, non-flow proportional, composite samples. Documentation should use chain-of-custody procedures. Samples would be more representative if they were taken throughout the year; however, since weather and base activity fluctuations are not dramatic at Beale AFB, 30 consecutive days of sampling followed by routine monitoring should be acceptable.

consecutive days of sampling followed by routine monitoring should be acceptable.

c. We have discussed the pros and cons of having samples analyzed by multiple labs. If we split samples between three laboratories as discussed between AFOEHL and Beale AFB personnel during the presurvey, one outcome could be three different results which would generate uncertainty in the numbers which the Air Force would like to present to the state. Unless the state has an additional requirement we recommend following Standard Methods and EPA analytical procedures with a single EPA and California approved laboratory.

d. AFOEHL is not certified in California for wastewater. However, Beale AFB can still choose to complete the analyses through AFOEHL by using Data Chem Inc., a Salt Lake City-based, California-certified contract laboratory. We would confirm the sampling regime and time frames with Beale AFB SGPB and coordinate to have the base send the sample results directly to Data Chem with a duplicate copy of all the documentation to AFOEHL/SA. Data Chem would provide the results to AFOEHL who would provide them in-turn to the base.

e. Should the base choose its own contract laboratory we would recommend the base require its laboratory to provide a QA plan describing the methods they use, instrumentation, personnel experience, LODs, analysis, extraction and completion dates, and turnaround times. Notwithstanding the laboratory's state and EPA certification, they should be able to demonstrate an on-going QA/QC program. In addition, the contract laboratory should provide the base a validation package on all results and QCs for each sample. Should you decide to pursue a separate contract laboratory, we would be glad to provide you checklists for QA/QC Project Plans and QA/QC Program Plans. The Project Plan can be used to evaluate the QA/QC in a one time situation like forming a team or evaluating a facility. The Program Plan should be part of your selected laboratory's operating procedures or charter of actions.

f. The AFOEHL Water Branch has a scheduled survey for Beale from 4-15 Feb 1991; however, if we can agree on a sampling protocol and regime, it might be more appropriate to have an AFOEHL engineer and technician on-site primarily to standardize procedures and provide spiked samples. If this is agreeable and results in a commitment of less manhours with fewer equipment requirements, we may be able to move the survey date forward.



EDWIN C. BANNER III, Col, USAF, BSC
Chief, Environmental Quality Division

cc: HQ AFSC/SGPB
7100 CSW Med Cen/SGB
Det 1, AFOEHL
HQ SAC/SGPB



DEPARTMENT OF THE AIR FORCE

814TH STRATEGIC HOSPITAL (SAC)

BEALE AIR FORCE BASE, CALIFORNIA 95903-5000

SGPB

4 Jan 1991

Consultative Letter, 90-206EQ00013LEF, Recommendations for Sampling Treatment Plant Effluent, Beale AFB, CA

USAFCEHL/BQW

1. We wish to follow the recommendations presented in your consultative letter. We agree with the use of Data Chem Inc., under OEHL contract, for the analysis of Beale AFB NPDES permit samples.
2. To carry out your recommendations we request that the scheduled 4-15 Feb 1991 USAFOEHL wastewater survey be conducted as planned. We agree that an OEHL engineer and technician on-site to oversee and train in proper sampling and preservation methods is a good idea. We look forward to your survey.
3. Thank you for an excellent consultative letter. Please let me know the specific dates and equipment requirements for your visit. We can help to arrange lodging and transportation. Give me a call at DSN 368-2635 or 4149 if you have any question or require additional information.

CHRISTOPHER P. C. SHERMAN, CAPT, USAF, BSC
Chief, Bicenvironmental Engineering Services

cc: HQ SAC/SGPB
814 SH/SGP
814 SH/SG
814 CES/DEV

Handwritten initials: HPP, C, E

APPENDIX C
Tentative Amended Cease and Desist Order,
1 Oct 90

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
CENTRAL VALLEY REGION1443 ROUTIER ROAD SUITE A
SACRAMENTO CA 95827-3098

1 October 1990

Colonel Harvey D. Chace, Commander
9th CSG/CC
Beale Air Force Base, CA 95903TENTATIVE AMENDED CEASE AND DESIST ORDER AND NOTICE REGARDING CEASE AND DESIST
HEARING FOR BEALE AIR FORCE BASE, WASTEWATER TREATMENT PLANT, YUBA COUNTY

Enclosed are a copy of the Notice of Public Hearing regarding the consideration of issuance of an amended Cease and Desist Order against the Base for continued violations of effluent limitations and a tentative copy of that Order.

If you have any questions, please contact Sue Y. Yee at (916) 361-5654.

A handwritten signature in cursive script, reading "J. Lawrence Pearson", is written over the typed name.

J. LAWRENCE PEARSON
Supervising Engineer

SYV

Enclosures

cc+Encl: [REDACTED], 834-886/DEY, Beale Air Force Base
Mr. Ken Goldberg, U.S. Environmental Protection Agency, Region IX,
San Francisco
Department of Fish and Game, Region II, Rancho Cordova
Department of Water Resources, Central District, Sacramento
State Water Resource Control Board, Office of Chief Counsel,
Sacramento
State Water Resource Control Board, Division of Water Quality,
Sacramento
Yuba County Environmental Health Department, Marysville

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO.

REQUIRING UNITED STATES AIR FORCE,
BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT, YUBA COUNTY
TO CEASE AND DESIST FROM
DISCHARGING WASTE CONTRARY TO REQUIREMENTS

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds:

1. On 28 March 1986, the Board adopted Waste Discharge Requirements Order No. 86-080, NPDES CA110299, for the United States Air Force, Beale Air Force Base, Sanitary Wastewater Treatment Plant (hereafter Discharger), Yuba County.
2. The Discharger discharges treated wastewater into Hutchinson Creek, thence Western Pacific Interceptor Drainage Canal, thence the Bear River, at a point in Section 4, T14N, R5E, MDB&M (001) and to golf course irrigation in Section 35, T15N, R5E, MDB&M (002).
3. Waste Discharge Requirements Order No. 86-080 contains, in part, effluent limitations and provisions as follows:

"A.1. The discharge of an effluent in excess of the following limits is prohibited (001 and 002):

<u>Constituents</u>	<u>Units</u>	<u>30-Day Average</u>	<u>7-Day Average</u>	<u>Daily Maximum</u>
****	****	****	****	****
Boron	mg/l	1.0	- - -	2.0
Total Cyanide	mg/l	0.0035	- - -	0.007

"E.2. The discharge shall not cause visible oil, grease, scum, foam, floating or suspended material in the receiving water or water courses.

"E.7. The discharge shall not cause the chlorine residual in Hutchinson Creek to exceed 0.1 mg/l."

4. On 20 May 1988, the Board adopted Cease and Desist Order No. 88-092 for continued violations of Effluent Limitation A.1 and Receiving Water Limitations E.2 and E.7 of Waste Discharge Requirements Order 86-080.

CEASE AND DESIST NO.
BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT, YUBA COUNTY

-3-

during 1989 and 1990 staff inspections of the SWTP revealed lower concentrations of boron and cyanide than had been reported by Beale.

16. Beale plans to split wastewater samples between its current and an outside laboratory to evaluate their analytical data reliability.
17. Beale recently proposed that reported cyanide violations have been false positive readings, caused by unknown chemical interferences in the analysis. Staff requested that Beale either provide more specific information on the nature of this interference or employ a more accurate method of analysis.
18. Beale was unable to comply with Order No. 88-092 by 15 June 1989. On that date, staff met with Beale representatives to discuss a revised time schedule for compliance activities.
19. On 2 August 1990, Beale submitted a Revised Compliance Schedule in which full compliance with waste discharge requirements occurs by 1 October 1991. The Base presented a list of interim activities, including the installation of a complete wastewater recycle system at the Photo Lab by 1 January 1991, continuation of the product search and substitution program, and further cyanide and MBAS studies.
20. On 2 November 1990, in Sacramento, after due notice to the Discharger and all other affected persons, the Board conducted a public hearing at which the Discharger appeared and evidence was received concerning the discharge.
21. Issuance of this Order is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq., in accordance with Section 15321(a)(2), Title 14, Chapter 3, California Code of Regulations.
22. Any person adversely affected by this action of the Board may petition the State Water Resources Control Board (State Board) to review the action. The petition must be received by the State Board within 30 days of the date on which the action was taken. Copies of the law and regulations applicable to filing petitions will be provided on request.

IT IS HEREBY ORDERED that Order 88-080 is rescinded and that:

1. The United States Air Force, Beale Air Force Base, Sanitary Wastewater Treatment Plant, shall cease and desist from discharging wastes contrary to Effluent Limitation A.1. and Receiving Water Limitation E.2 of Order No. 86-080, by 1 October 1991.
2. Pursuant to Section 13267 of the California Water Code, the United States Air Force, Beale Air Force Base, shall submit a technical report,

STAFF REPORT

UNITED STATES AIR FORCE, BEALE AIR FORCE BASE WASTEWATER TREATMENT PLANT, FUBA COUNTY CEASE AND DESIST ORDER

Beale Air Force Base is approximately 10 miles east of Marysville. Operations at Beale include aircraft runways, hangars, and maintenance facilities, office and support facilities, personnel housing and a major radar facility. Wastewater from the operations is treated at the Base Sanitary Wastewater Treatment Plant (SWTP). The plant is regulated by Waste Discharge Requirements (WDRs) Order No. 86-080, NPDES No. CA0110299, adopted on 28 March 1986. On 27 June 1988, Special Order 86-124 was adopted, amending the waste discharge requirements to include the 15 May 1986 Standard Provisions and Reporting Requirements (NPDES).

WASTEWATER TREATMENT PLANT

The Base SWTP consists of pretreatment, primary clarification, trickling filters, secondary clarification, chlorination and effluent equalization. The plant has a design capacity of 5.0 mgd and an average flow of 1.0 mgd. The treatment plant effluent is initially discharged to a holding pond immediately south of the plant. From the pond, the effluent either flows to Hutchinson Creek (001) or is pumped to the base golf course (002) for irrigation. Hutchinson Creek flows seasonally in the area of the Base and is often dry upstream of the subject discharge. The locations of the wastewater treatment plant and appurtenant facilities are illustrated in Figure 1.

Approximately 20,000 gpd of pretreated photographic wastewater is discharged to the SWTP. Since 1966, the Photo Wastewater Treatment Plant (PWTP) has been used to treat wastes from Beale's photographic laboratory. The PWTP processes include equalization, chemical flocculation, settling, and filtration. The only current use of the PWTP, however, is pH adjustment of the photographic wastewater. Three injection wells were used for disposal of PWTP effluent until April 1986. Since then, the PWTP has discharged to the SWTP.

CEASE AND DESIST ORDER NO. 88-092

From 1986 to 1988 Beale repeatedly exceeded its boron and cyanide effluent limitations and violated its foam and chlorine residual receiving water limitations. On 20 May 1983, the Regional Board adopted Cease and Desist (C&D) Order No. 88-092 requiring Beale to cease discharging wastes contrary to effluent and receiving water limitations of Order No. 85-030 by 15 June 1989. As interim measures, Beale was required to submit a technical report and monthly progress reports, describing the results and findings of efforts taken to identify and resolve source(s) of the WDR violations.

COMPLIANCE ACTIVITIES

Beale contracted the USAF Occupational Environmental Health Laboratory (OEHL) to conduct a Wastewater Characterization/Hazardous Waste Survey in September 1983. The survey results indicated that the major boron and cyanide sources were the Precision Photographic Laboratory (Photo Lab) and other film processing facilities. Maintenance facilities using soaps and detergents were also found

STAFF REPORT
BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT, YUBA COUNTY

-3-

the data presented in Beale's self monitoring reports and the results of split samples Beale personnel obtained during the inspection. Staff recommended that Base begin splitting wastewater samples between their current laboratory and an outside laboratory to determine the reliability of the present analytical results.

Beale recently proposed that the reported cyanide violations have actually been false positive readings, caused by unknown chemical interferences in the analysis. Because the SWTP studies repeated showed more cyanide leaving the plant than entering it, and a source of cyanide could not be identified in the plant, Beale personnel began splitting the wastewater samples obtained for cyanide analysis. One set of samples was pretreated with sodium thiosulfate while the other set was not. The pretreated samples were not detected to contain cyanide while the other samples were detected to contain significant levels of cyanide. Beale proposed that pretreatment of samples with sodium thiosulfate prevents the interference in their present method of cyanide analysis; however, the Base is unable to identify the interfering chemical. Staff has requested that Beale either provide more specific information on the nature of this interference or employ a more accurate method of analysis.

C&D ORDER NO. 88-092 COMPLIANCE STATUS

The Base has complied with the Chlorine Residue effluent limitation every month since the adoption of the Cease and Desist Order.

Beale has made an effort to reduce the amount of surfactants discharged to Hutchinson Creek through product substitution and changes in operating procedures. However, there continues to be foaming at the discharge point, in violation of Receiving Water Limitation E.2.

Beale has exceed the 30-day average effluent limitation for boron every month since the adoption of the C&D.

From May 1988 to July 1990, Beale violated the cyanide effluent limitation on a minimum of 18 months. On the other 9 months, cyanide was not detected in the effluent wastewater samples, but the detection level of the analytical method employed was higher than the effluent limitation.

Beale was unable to comply with Order No. 88-092 by 15 June 1989. On that date, Regional Board Staff met with Beale representatives to discuss a revised time schedule for compliance activities.

AMENDED C&D COMPLIANCE SCHEDULE

On 2 August 1990, Beale submitted a Revised Compliance Schedule, with 1 October 1991 listed as date for full compliance with waste discharge requirements. The Base proposed a list of interim activities, including installation of a closed loop wastewater recycle system at the Photo Lab by 1 January 1991, a continuation

**CHRONOLOGY FOR BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY
CEASE AND DESIST ORDER**

28 Mar 1986	Board adopts Waste Discharge Requirements (WDR) Order No. 86-080, NPDES No. CA0110299, for the Beale Air Force Base Sanitary Wastewater Treatment Plant (SWTP).
27 Jun 1986	Board adopts Special Order No. 86-124 amending WDR Order No. 86-080 to include revised Standard Provisions and Reporting Requirements.
2 Dec 1986	Staff sends letter to Beale describing deficiencies with SWTP self-monitoring reports.
5 Mar 1987	Staff sends letter to Beale expressing concern with the Base's practice of discharging pesticide and herbicide rinse water to sewer system.
15 Jun 1987	Staff sends letter to Beale regarding WDR violations revealed by monitoring report review and facility inspection. Board requests Beale submit, by 31 July 1987, a time schedule for bringing plant into compliance with WDRs.
17 Aug 1987	Beale submits report describing actions taken/to be taken for alleviating WDR violations.
4 Apr 1988	Staff meet with Beale personnel to discuss WDR violations and pending enforcement actions.
14 Apr 1988	Beale submits tasks list and time schedule for identification of boron, cyanide, and surfactant sources in SWTP discharge.
14 Apr 1988	Staff inspects SWTP. Foam noted at the discharge point to Hutchinson Creek.
20 May 1988	Board adopts Cease and Desist (C&D) Order No.88-092 requiring Beale to cease discharging wastes contrary to effluent and receiving water limitations by 15 June 1989. As an interim measure, the C&D required monthly progress reports and a technical report by 31 January 1989, describing results and findings of efforts taken to identify and resolve source(s) of WDR violation.
10 Oct 1988	Staff conducts enforcement follow-up inspection of SWTP.
16 Dec 1988	Staff inspects SWTP and collects discharge samples. Analyses reveal plant complying with WDRs.
1 Feb 1989	Beale submits USAF Occupational Environmental Health Lab (OEHL) report regarding September 1988 Wastewater Characterization/Hazardous Waste Survey. Survey results indicate major boron and cyanide sources to be Precision Photographic Laboratory (Photo Lab) and other film processing facilities. Maintenance facilities using soaps and detergents

CHRONOLOGY
BEALE AIR FORCE BASE
SANITARY WASTEWATER TREATMENT PLANT, YUBA COUNTY

-3-

source to be Photo Lab and reveal cyanide levels in wastewater increase after entering treatment plant.

- 17 May 1990 Beale collects wastewater samples from several locations in the treatment plant and sludge samples from different heights in digesters. Boron and cyanide sample analyses reveal elevated boron levels throughout plant, at discharge, and in digester sludge. Cyanide not detected in any wastewater or sludge samples.
- 26 Jun 1990 In monthly status report, Beale suggests elevated cyanide measurements due to chemical interferences. Theory based on results of split sampling and pretreatment of samples with sodium thiosulfate. Beale further suggests boron violations will cease with installation of Photo Lab wastewater recycle system.
- 2 Aug 1990 Beale submits Revised Compliance Schedule. Beale proposes to fully comply with waste discharge requirements by 1 October 1991. Interim activities include installation of closed loop wastewater recycle system at the Photo Lab by 1 January 1991, continued product search and substitution program, and additional cyanide and MBAS studies.
- 7 Aug 1990 Staff inspects SWTP and splits wastewater samples with Base personnel. Staff's analytical results show SWTP operating in compliance with Order No. 86-080 at time of inspection. These results not only contradict data provided in Beale's past self monitoring reports, but also differ from that of split samples Sgt. Marc Mason obtained during inspection.
- 23 Aug 1990 During telephone conversation with Staff, Sgt. Mason provides split samples results. His results are consistent with that presented in recent self monitoring reports but substantially higher than obtained by Board contract laboratory.
- 23 Aug 1990 Staff sends contract laboratory results to Beale and recommends Base begin splitting samples between current laboratory and an outside laboratory to determine reliability of analytical results.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3443 ROUTIER ROAD
SACRAMENTO, CALIFORNIA 95827-3098

NOTICE OF PUBLIC HEARING

in the matter of
BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, will hold a public hearing:

DATE: 2 November 1990
TIME: 9:00 a.m.
PLACE: State Capitol, Room 447
(11th between L and N)
Sacramento, California

to consider amending a Cease and Desist Order issued on 20 May 1988, pursuant to Section 13301 of the California Water Code.

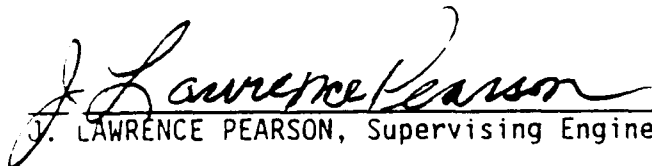
The Base has violated and threatens to continue to violate, Cease and Desist Order No. 88-092 which prohibits the discharge of waste in violation of Effluent Limitations A.1 of Order No. 86-080.

The Board's staff, the discharger, and other interested persons will be given an opportunity to present evidence concerning violations of the Cease and Desist Order. The discharger and all other interested persons may, but need not, be represented by counsel.

If possible, written copies of testimony to be presented at the hearing should be furnished to the Board in advance of the hearing.

The Regional Board files on Beale Air Force Base are open to the public. The files may be inspected and copied at the Board's office during weekdays between 8:00 a.m. and 5:00 p.m. To review the files, please contact Sue Y. Yee at (916) 361-5654 and make an appointment.

Please bring the above information to the attention of anyone you know who would be interested in this matter.


J. LAWRENCE PEARSON, Supervising Engineer

SY: 26 September 1990

APPENDIX D
Tentative Sewage Treatment Plant
NPDES Permit, 21 Feb 91



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 814TH COMBAT SUPPORT GROUP (SAC)
BEALE AIR FORCE BASE, CALIFORNIA 95903-5000



21 FEB 1991

REPLY TO
ATTN OF:

814 CES/DEV (Mr Miller, 4591)

SUBJECT:

Tentative Sewage Treatment Plant NPDES Permit

TO:

DISTRIBUTION

1. The Environmental Branch (DEV) submitted a permit renewal application for Beale's sewage treatment plant to the California Regional Water Quality Control Board on 27 Nov 90. On 11 Feb 91, DEV received the tentative waste discharge requirements (WDR).
2. Please review and comment on the new WDRs by 1 Mar 91. Failure to respond will assume that the new requirements are reasonable as presented in the documents.
3. POC is Greg Miller 368-2482.

Bruce S. Reinhardt

BRUCE S. REINHARDT, Acting Chief
Environmental Branch

1 Atch
1 Transmittal of
Tentative Waste
Discharge Requirements

DISTRIBUTION

HQ SAC/DEV/DEM
814 CES/DEM
814 HOSP/SGPB
AF/LEEV-WR
14 AD/JA
USAF OEHL/EQW

AFD 0400D

Approved

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
CENTRAL VALLEY REGION

3443 ROUTIER ROAD, SUITE A
SACRAMENTO, CA 95827-3098
PHONE: (916) 361-5800
FAX: (916) 361-5686



DOE ESA 2/2

11 February 1991

Lt. Colonel Gary L. Tucker *DEV*
9th CES/DEV *14 FEB Do we really pay?*
Beale Air Force Base, CA 95903

TRANSMITTAL OF TENTATIVE WASTE DISCHARGE REQUIREMENTS (NPDES NO. CA0110299)
FOR U. S. AIR FORCE-BEALE AIR FORCE BASE WASTEWATER TREATMENT PLANT, YUBA
COUNTY - CASE NO. 132

We are now charging dischargers a fee based on an annual billing cycle. Your annual fee will be \$1,300.00 based on your 1-A rating. Please submit your first annual fee by 1 March 1991. You will then be billed annually in August from now on.

Any comments or recommendation you may have concerning this tentative order should be submitted to this office by 15 March 1991 in order that consideration may be given them prior to the meeting of the Regional Board.

Please review this permit carefully, as there are some important changes and additional monitoring requirements. EPA regulations require the initiation of effluent toxicity monitoring programs on all significant NPDES discharges. The monitoring must consist of three species bioassay testing, utilizing standard EPA protocol. This requirement has been added to the subject NPDES permit with a compliance schedule for implementation of the program by 1 January 1992.

Also, there are some additional Discharge Specifications regarding your golf course irrigation and Effluent Limitations on your discharge. An MBAS limitation and a total petroleum hydrocarbon (diesel range) limitation has been added to your permit, based on the industrial discharges to your system. Monitoring of the amounts of the discharges to the golf course will now be required, as well as total petroleum hydrocarbon (all ranges) and ammonia levels on your discharge. New compliance dates for our previously requested sludge management plan and evaluation of your potential sludge disposal alternatives is also included in the permit. This is required since your previous practice of discharging sludge to the Base landfill is no longer acceptable.

As for the three species testing, you probably should start with a simple "whole effluent toxicity screening" program, including at least quarterly tests done for a period of at least one year. This will consist of simply subjecting your effluent to the three species test with no dilution. If significant toxicity is determined, then "chemical specific screening" would be necessary. This phase of the program would consist of bioassay testing on various dilution ratios between your effluent and upstream receiving water (or the laboratory's bioassay water) to determine if actual instream toxicity may

Tentative Requirements
U. S. Air Force
Beale Air Force Base
Wastewater Treatment Plant
Yuba County

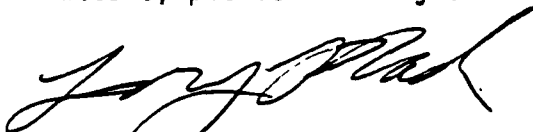
-2-

11 February 1991

be occurring. If any phase of the program indicates the potential for significant instream toxicity, then an approved Toxicity Reduction Evaluation (TRE) should be implemented.

We will be revising your self-monitoring report forms to reflect the changes mentioned in this letter, beginning with the July 1991 monitoring period. These forms should be submitted to us on a monthly basis, as you have done in the past.

Enclosed is a list of laboratories that are presently performing three species bioassays for your benefit. If you have any questions regarding these matters, please call Roy Butz at (916) 361-5651.



LARRY F. NASH
Senior Engineer

RJB:gs

Enclosures - Tentative Order
Standard Provisions + Lab List (discharger only)

cc: U. S. Environmental Protection Agency, Region 9, San Francisco
U. S. Corps of Engineers, Sacramento
U. S. Fish and Wildlife Service, Sacramento
National Marine Fisheries Service, Santa Rosa
Department of Health Services, Redding
Department of Fish and Game, Region II, Rancho Cordova
Department of Water Resources, Central District, Sacramento
Mrs. Betsy Jennings, Office of the Chief Counsel, Water Resources Control Board, Sacramento
Division of Regulatory Support, Water Quality Branch, State Water Resources Control Board, Sacramento
Yuba County Health Department, Marysville
Yuba County Planning Department, Marysville

California Regional Water Quality Control Board - Central Valley Region

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS
(National Pollutant Discharge Elimination System)

1 OCTOBER 1990

A. GENERAL PROVISIONS

1. Any violation of this Order constitutes a violation of the federal Clean Water Act (CWA) and the California Water Code (CWC) and, therefore, may result in enforcement action under either or both laws.
2. The CWC and the CWA provide that any person who violates a portion of this Order implementing Sections 301, 302, 306, 307, 308, 318 or 405 of the CWA is subject to a civil penalty not to exceed \$25,000 per day of such violation. Any person who negligently violates this Order with regard to these sections of the CWA is subject to a fine of not less than \$5,000 or more than \$25,000 per day of violation, or to imprisonment for not more than one year, or both. Larger penalties may be imposed for multiple violations and knowing violations.
3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another; protect the Discharger from liability under federal, state, or local laws; or guarantee the Discharger a capacity right in the receiving waters.
4. The Discharger shall allow representatives of the Regional Water Quality Control Board (hereafter Board), the State Water Resources Control Board and the Environmental Protection Agency (hereafter EPA), upon presentation of credentials, at reasonable hours, to:
 - a. enter premises where wastes are treated, stored, or discharged and facilities in which any required records are kept;
 - b. copy any records required to be kept under terms and conditions of this Order;
 - c. inspect facilities, monitoring equipment, practices, or operations regulated or required by this Order; and
 - d. sample, photograph or video tape any discharge, waste, waste unit or monitoring device.
5. If the Discharger's wastewater treatment plant is publicly owned or subject to regulation by the California Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to Title 23, California Code of Regulations (CCR), Division 3, Chapter 14.
6. The Discharger shall at all times properly operate and maintain all facilities, and systems of treatment and control (and related appurtenances) that are installed or used to achieve compliance with this Order.

Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger only when necessary to achieve compliance with this Order.

7. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
 - a. violation of any term or condition contained in this Order;
 - b. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;
 - c. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and
 - d. a material change in the character, location, or volume of discharge.

The Board may review and revise this Order at any time upon application of any affected person or the Board's own motion.

The filing of a request by the Discharger for modification, revocation and reissuance, or termination of this Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of this Order.

The Discharger shall furnish, within a reasonable time, any information the Board or EPA may request to determine compliance with this Order or whether cause exists for modifying or terminating this Order. The Discharger shall also furnish to the Board, upon request, copies of records required to be kept by this Order.

8. If a toxic effluent standard or prohibition (including any scheduled compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the CWA, or amendments thereto, for a toxic pollutant that is present in the discharge authorized herein, and such standard or prohibition is more stringent than any limitation upon such pollutant in this Order, the Board will revise or modify this Order in accordance with such toxic effluent standard or prohibition.

The Discharger shall comply with effluent standards and prohibitions within the time provided in the regulations that establish those standards or prohibitions, even if this Order has not yet been modified.

9. If more stringent applicable water quality standards are approved, pursuant to Section 303 of the CWA, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System)

-3-

10. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:

- a. contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or
- b. controls any pollutant limited in the Order.

The Order, as modified or reissued under this paragraph, shall also contain any other requirements of the CWA then applicable.

11. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.

12. By-pass (the intentional diversion of waste streams from any portion of a treatment facility or collection system, except those portions designed to meet variable effluent limits) is prohibited except under the following conditions:

- a. (1) by-pass was unavoidable to prevent loss of life, personal injury, or severe property damage; (severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a by-pass; severe property damage does not mean economic loss caused by delays in production;)

and

- (2) there were no feasible alternatives to by-pass, such as the use of auxiliary treatment facilities or retention of untreated waste; this condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance;

or

- b. (1) by-pass is required for essential maintenance to assure efficient operation;

and

- (2) neither effluent nor receiving water limitations are exceeded;

and

(3) the Discharger notifies the Board ten days in advance.

The permittee shall submit notice of an unanticipated by-pass as required in paragraph 8.1. below.

13. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, failure to implement an appropriate pretreatment program, or careless or improper action. A Discharger that wishes to establish the affirmative defense of an upset in an action brought for noncompliance shall demonstrate, through properly signed, contemporaneous operating logs, or other evidence, that:
 - a. an upset occurred due to identifiable cause(s);
 - b. the permitted facility was being properly operated at the time of the upset;
 - c. notice of the upset was submitted as required in paragraph 8.1.; and
 - d. remedial measures were implemented as required under paragraph A.16.

In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof.

14. This Order is not transferable to any person except after notice to the Board. The Board may modify or revoke and reissue the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA.
15. Except for data determined to be confidential under Section 13267 of the CWC, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Board and EPA. Effluent data are not confidential.
16. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from noncompliance with this Order, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.
17. The fact that it would have been necessary for the Discharger to halt or reduce the permitted activity in order to comply with this Order shall not be a defense for violating this Order.

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System)

-5-

18. The Discharger shall ensure compliance with any existing or future pretreatment standard promulgated by EPA under Section 307 of the CWA, or amendment thereto, for any discharge to the municipal system.
19. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.
20. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.

B. GENERAL REPORTING REQUIREMENTS

1. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, daily maximum effluent limitation, or receiving water limitation of this Order, the Discharger shall notify the Board by telephone (916) 361-5600 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation. Other noncompliance requires written notification as above at the time of the normal monitoring report.
2. Safeguard to electric power failure:
 - a. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.
 - b. Upon written request by the Board the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Board.
 - c. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Board not approve the existing safeguards, the Discharger shall, within ninety days of having been advised in writing by the Board that the existing safeguards are inadequate, provide to the Board and EPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this

Order. The schedule of compliance shall, upon approval of the Board, become a condition of this Order.

3. The Discharger, upon written request of the Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under 8.2.

The technical report shall:

- a. Identify the possible sources of spills, leaks, untreated waste bypass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.
- b. Evaluate the effectiveness of present facilities and procedures and state when they became operational.
- c. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

The Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

4. The Discharger shall file with the Board a Report of Waste Discharge at least 180 days before making any material change in the character, location, or volume of the discharge. A material change includes, but is not limited to, the following:
 - a. Adding a major industrial waste discharge to a discharge of essentially domestic sewage, or adding a new process or product by an industrial facility resulting in a change in the character of the waste.
 - b. Significantly changing the disposal method or location, such as changing the disposal to another drainage area or water body.
 - c. Significantly changing the method of treatment.
 - d. Increasing the discharge flow beyond that specified in the Order.
5. A publicly owned treatment works (POTW) whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years,

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System)

-7-

the Discharger shall notify the Board by 31 January. A copy of the notification shall be sent to appropriate local elected officials, local permitting agencies and the press. Within 120 days of the notification, the Discharger shall submit a technical report showing how it will prevent flow volumes from exceeding capacity or how it will increase capacity to handle the larger flows. The Board may extend the time for submitting the report.

6. A manufacturing, commercial, mining, or silvicultural discharger shall notify the Board as soon as it knows or has reason to believe:

- a. That any activity has occurred or will occur that would result in the discharge of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels":

- (1) 100 micrograms per liter (ug/l);
- (2) 200 ug/l for acrolein and acrylonitrile; 500 ug/l for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/l) for antimony;
- (3) five times the maximum concentration value reported for that pollutant in the Report of Waste Discharge; or
- (4) the level established by the Board in accordance with 40 CFR 122.44(f).

- b. That it expects to begin to use or manufacture, as an intermediate or final product or by-product, any toxic pollutant that was not reported in the Report of Waste Discharge.

7. A POTW shall provide adequate notice to the Board of:

- a. any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Sections 301 or 306 of the CWA if it were directly discharging those pollutants, and
- b. any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order.

Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

8. The Discharger shall give advance notice to the Board of any planned changes in the permitted facility or activity that may result in non-compliance with this Order.

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System) . .

-3-

9. The Discharger shall submit technical reports as directed by the Executive Officer.
10. Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Order, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both.

C. PROVISIONS FOR MONITORING

1. All analyses shall be performed in accordance with the latest edition of *Guidelines Establishing Test Procedures for Analysis of Pollutants*, promulgated by EPA (40 CFR 136) or other procedures approved by the Board.
2. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the Discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Board.

Unless otherwise specified, all metals shall be reported as Total Metals.

Unless otherwise specified, bioassays shall be performed in the following manner:

- a. Acute bioassays shall be performed in accordance with guidelines approved by the Board and the Department of Fish and Game or in accordance with methods described in EPA's manual for measuring acute toxicity of effluents (EPA/620/4-85/013 and subsequent amendments).
 - b. Short-term chronic bioassays shall be performed in accordance with EPA guidelines (EPA/600/4-89/001 and subsequent amendments).
3. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Board and EPA.
 4. The Discharger shall conduct analysis on any sample provided by EPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to EPA's DMQA manager.

5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.
6. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.
7. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or be imprisoned for not more than two years per violation, or by both.
8. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.
9. The records of monitoring information shall include:
 - a. the date, exact place, and time of sampling or measurements,
 - b. the individual(s) who performed the sampling of measurements,
 - c. the date(s) analyses were performed,
 - d. the individual(s) who performed the analyses,
 - e. the laboratory which performed the analyses,
 - f. the analytical techniques or methods used, and
 - g. the results of such analyses.

D. REPORTING REQUIREMENTS FOR MONITORING

1. The Discharger shall file with the Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this Order.
2. Monitoring reports shall be submitted on forms to be supplied by the Board to the extent that the information reported may be entered on the forms. Alternate forms may be approved for use by the Board.
3. The results of all monitoring required by this Order shall be reported to the Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order.

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System)

-10-

Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

4. The results of analyses performed in accordance with specified test procedures, taken more frequently than required at the locations specified in the Monitoring and Reporting Program, shall be reported to the Board and used in determining compliance.
5. Upon written request of the Board, the Discharger shall submit a summary monitoring report to the Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).
6. All reports shall be signed by a person identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in 7a, 7b or 7c of this requirement if;
 - (1) the authorization is made in writing by a person described in 7a, 7b, or 7c of this provision,
 - (2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position), and
 - (3) the written authorization is submitted to the Board.

Each person signing a report required by this Order or other information requested by the Board shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System)

-11-

knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

The Discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
3443 Routier Road, Suite A
Sacramento, CA 95827-3098

In addition, dischargers designated as a "major" discharger shall transmit a copy of all monitoring reports to EPA (see address in Provision G.10).

E. DEFINITIONS:

1. The daily discharge rate is obtained from the following calculation for any calendar day:

$$\text{Daily discharge rate (lbs/day)} = \frac{8.34}{N} \sum_{i=1}^N Q_i C_i$$

In which N is the number of samples analyzed in a day. Q_i and C_i are the flow rate (mgd) and the constituent concentration (mg/l), respectively, which are associated with each of the N grab samples which may be taken in a day. If a composite sample is taken, C_i is the concentration measured in the composite sample and Q_i is the average flow rate occurring during the period over which samples are composited.

2. The monthly or weekly average discharge rate is the total of daily discharge rates during a calendar month or week, divided by the number of days in the month or week that the facility was discharging.

Where less than daily sampling is required by this permit, the monthly or weekly average discharge rate shall be determined by the summation of all the daily discharge rates divided by the number of days during the month or week for which the rates are available.

For other than weekly or monthly periods, compliance shall be based upon the average of all rates available during the specified period.

3. The monthly or weekly average concentration is the arithmetic mean of measurements made during a calendar month or week, respectively.
4. The daily maximum discharge rate means the total discharge by weight during one day.

5. The **daily maximum concentration** is the greatest concentration found in grab or composite samples analyzed for one day.
6. A **grab sample** is an individual sample collected in less than 15 minutes.
7. Unless otherwise specified, a **composite sample** is a combination of individual samples collected over the specified sampling period:
 - a. at equal time intervals, with a maximum interval of one hour, and
 - b. at varying time intervals (average interval one hour or less) so that each sample represents an equal portion of the cumulative flow.

The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results.

8. **Sludge** means the solids, residues, and precipitates separated from, or created in, wastewater by the unit processes of a treatment system.
9. **Median** is the value below which half the samples (ranked progressively by increasing value) fall. It may be considered the middle value, or the average of the two middle values.
10. **Overflow** means the intentional or unintentional diversion of flow from the collection and transport systems, including pumping facilities.

F. PRETREATMENT PROGRAM REQUIREMENTS (Applies to dischargers required to establish pretreatment programs by this Order.)

1. The Discharger shall perform the pretreatment functions as required in 40 CFR Part 403 including, but not limited to:
 - a. Implement the necessary legal authorities as provided in 40 CFR 403.8(f)(1).
 - b. Enforce the pretreatment requirements under 40 CFR 403.5 and 403.6.
 - c. Implement the programmatic functions as provided in 40 CFR 403.8(f)(2).
 - d. Provide the requisite funding and personnel to implement the pretreatment program as provided in 40 CFR 403.8(f)(3).

G. ANNUAL PRETREATMENT REPORT REQUIREMENTS (Applies to dischargers required to establish pretreatment programs by this Order.)

An annual report shall be submitted by 28 February or as otherwise specified in the Order and include at least the following items:

1. A summary of analytical results from representative, flow-proportioned, 24-hour composite sampling of the POTW's influent and effluent for those pollutants EPA has identified under Section 307(a) of the CWA which are known or suspected to be discharged by industrial users.

The Discharger is not required to sample and analyze for asbestos until EPA promulgates an applicable analytical technique under 40 CFR 136. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and sludge sampling and analysis shall be performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass-Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR 136 and amendments thereto.

2. A discussion of Upset, Interference, or Pass-Through incidents, if any, at the treatment plant which the Discharger knows or suspects were caused by industrial users of the POTW. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass-Through, Interference, or noncompliance with sludge disposal requirements.
3. The cumulative number of industrial users that the Discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.
4. An updated list of the Discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The Discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The Discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:
 - a. complied with baseline monitoring report requirements (where applicable);
 - b. consistently achieved compliance;

- c. inconsistently achieved compliance;
- d. significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);
- e. complied with schedule to achieve compliance (include the date final compliance is required);
- f. did not achieve compliance and not on a compliance schedule; and
- g. compliance status unknown.

A report describing the compliance status of each industrial user characterized by the descriptions in items c. through g. above shall be submitted for each calendar quarter within 21 days of the end of the quarter. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

- 5. A summary of the inspection and sampling activities conducted by the Discharger during the past year to gather information and data regarding the industrial users. The summary shall include:
 - a. the names and addresses of the industrial users subjected to surveillance and an explanation of whether they were inspected, sampled, or both and the frequency of these activities at each user; and
 - b. the conclusions or results from the inspection or sampling of each industrial user.
- 6. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:
 - a. Warning letters or notices of violation regarding the industrial users' apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations.
 - b. Administrative orders regarding the industrial users' noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
 - c. Civil actions regarding the industrial users' noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
(National Pollutant and Discharge Elimination System)

-15-

- d. Criminal actions regarding the industrial users' noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
 - e. Assessment of monetary penalties. For each industrial user identify the amount of the penalties.
 - f. Restriction of flow to the POTW.
 - g. Disconnection from discharge to the POTW.
- 7. A description of any significant changes in operating the pretreatment program which differ from the information in the Discharger's approved Pretreatment Program including, but not limited to, changes concerning: the program's administrative structure, local industrial discharge limitations, monitoring program or monitoring frequencies, legal authority or enforcement policy, funding mechanisms, resource requirements, or staffing levels.
 - 8. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.
 - 9. A summary of public participation activities to involve and inform the public.
 - 10. A description of any changes in sludge disposal methods and discussion of any concerns not described elsewhere in the report.

Duplicate signed copies of these reports shall be submitted to the Board and the

State Water Resources Control Board
Division of Water Quality
Pretreatment Program
P.O. Box 100
Sacramento, CA 95812-0100

and the

Regional Administrator
U.S. Environmental Protection Agency W-3
1235 Mission Street
San Francisco, CA 94103

#

MEMORANDUM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD • CENTRAL VALLEY REGION

3443 Routier Road
Sacramento, CA 95827-3098

Phone: (916) 361-5600
ATSS: 8-495-5600

TO: Area Engineers

FROM: Christopher Foe

DATE: 17 March 1989

SIGNATURE: Christopher Foe

SUBJECT: COMMERCIAL LABORATORIES PERFORMING THE NEW EPA THREE SPECIES
BIOASSAY PROCEDURE

The facilities listed below report that they have the capability and are presently performing three species bioassays. This list has been compiled and is maintained up to date in order to help you and the discharger community acquire toxicity services. Presence on this list does not imply endorsement by Regional Board staff.

MEC Analytical Systems
98 Main Street, Suite 428, Tiburon, CA, 94920
Contact Person: Bridget Hejzmanek (415-435-1847).

Aqua Terra Technologies
2950 Buskirk Ave, Suite 120, Walnut Creek, CA, 94596
Contact Person: Bill Foster (415-934-4884)

EA Engineering and Science
41 LaFayette Circle, LaFayette, CA, 94549
Contact Person: Steve Risch (415-283-7077)

Marine Bioassay Laboratories
1234 Highway one, Watsonville, CA, 95076
Contact Person: Raymond Markel (408-724-4522)

Sierra Foothill Laboratories
323 S. HWY 49
P.O. Box 1268
Jackson, CA, 95642
Contact Person: Mrs. Sandy Nurse (209-223-2800)

EVS Consultants
2335 Eastlake Ave East
Seattle, WA, 98102
Contact Person: Peter Chapman (206-328-4138)

Battelle Columbus
505 King Ave
Columbus, OH 43201
Contact Person: Anthony Maciorowski (614-424-7575)

ERC Environmental and Energy Services Co.
5510 Morehouse Drive
San Diego, CA, 92121-1709
Contact Person: Dennis Lee (619-458-9044)

S.R. Hanson and Associates
83 Fairlawn Drive
Berkeley, CA, 94708
Contact Person: Steve Hanson (415-843-1556)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO.

NPDES NO. CA0110299

WASTE DISCHARGE REQUIREMENTS
FOR
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. U. S. Air Force, Beale Air Force Base Wastewater Treatment Plant (hereafter Discharger) submitted a Report of Waste Discharge, dated 28 November 1990, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES).
2. The Discharger discharges treated domestic waste from their wastewater treatment plant into Hutchinson Creek, thence Western Pacific Interceptor Drainage Canal, thence the Bear River, waters of the United States, at a point in Section 4, T14N, R5E, MDB&M (001), and to golf course irrigation in Section 35, T15N, R5E, MDB&M (002), as shown on Attachment A, a part of this Order.
3. The Report of Waste Discharge describes the discharge as follows:

Average Flow: 0.7 million gallons per day (mgd)
Design Flow: 5.0 mgd

<u>Constituent</u>	<u>mg/l</u>	<u>lbs/day</u>
BOD	15	87
Suspended Matter	15	87

4. As of 19 October 1990, the Base photo laboratory ceased all waste discharge to the treatment facilities. The photo waste is now treated entirely with a closed loop recycling/evaporative treatment system. The system produces a sludge which is shipped off-site for further processing or disposal. Clean water capable of being recycled is also a by-product of the photo waste treatment system.
5. The Environmental Protection Agency (EPA) and the Board have classified this discharge as a major discharge.
6. The Board has adopted a Water Quality Control Plan, 2nd Edition, for the Sacramento River Basin (5A) which contains water quality objectives for all waters of the Basin. These requirements are consistent with that Plan.

WASTE DISCHARGE REQUIREMENTS
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-2-

7. The beneficial uses of Hutchinson Creek, Western Pacific Interceptor Drainage Canal, and the Bear River are agricultural supply; recreation; aesthetic enjoyment; navigation; ground water recharge, fresh water replenishment; and preservation and enhancement of fish, wildlife and other aquatic resources.
8. The beneficial uses of the ground water are municipal, industrial, agricultural, and domestic supply.
9. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 208(b), 301, 302, 304, and 307 of the Clean Water Act and amendments thereto are applicable to the discharge.
10. The discharge is presently governed by Waste Discharge Requirements Order No. 86-080, adopted by the Board on 28 March 1986.
11. The action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, et seq.), in accordance with Section 13389 of the California Water Code.
12. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
13. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
14. This Order shall serve as an NPDES permit pursuant to Section 402 of the Clean Water Act, or amendments thereto, and shall take effect ten days from the date of hearing, provided EPA has no objections.

IT IS HEREBY ORDERED that Order No. 86-080 be rescinded and U. S. Air Force - Beale Air Force Base Wastewater Treatment Plant, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Effluent Limitations:

1. The discharge of an effluent in excess of the following limits is prohibited:

<u>Constituents</u>	<u>Units</u>	<u>30-Day Average</u>	<u>7-Day Average</u>	<u>Daily Maximum</u>
BOD ¹	mg/l	30	45	60
	lbs/day ²	1250	1875	2505
Total Suspended Matter	mg/l	30	45	60
	lbs/day ²	1250	1875	2505

WASTE DISCHARGE REQUIREMENTS --
 U. S. AIR FORCE - BEALE AIR FORCE BASE
 WASTEWATER TREATMENT PLANT
 YUBA COUNTY

-3-

<u>Constituents</u>	<u>Units</u>	<u>30-Day Average</u>	<u>7-Day Average</u>	<u>Daily Maximum</u>
Settleable Matter	ml/l	0.1	---	0.2
Chlorine Residual	mg/l	---	---	0.1
Oil and Grease	mg/l	10	15	20
Total Petroleum Hydrocarbons (Diesel Range)	mg/l	0.1	---	0.2
MBAS	mg/l	0.5	---	1.0
Total Cadmium	mg/l	0.01	---	0.02
Total Lead	mg/l	0.05	---	0.1
Hexavalent Chromium	mg/l	0.05	---	0.1
Total Barium	mg/l	1.0	---	2.0
Total Copper	mg/l	0.05	---	0.1
Total Mercury	mg/l	0.002	---	0.004
Total Silver	mg/l	0.05	---	0.1
Boron	mg/l	1.0	---	2.0
Total Cyanide	mg/l	0.005	---	0.01

¹ 5-day, 20.C biochemical oxygen demand (BOD)

² Based upon a design treatment capacity of 5.0 mgd

2. The number of coliform organism in wastewater discharged to Hutchinson Creek (001) or the golf course (002) shall not exceed:

<u>Units</u>	<u>30-Day Median</u>	<u>Daily Maximum</u>
MPN/100 ml	23	230

3. The arithmetic mean BOD (5-day) and total suspended matter in effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal).
4. The discharge shall not have a pH less than 6.5 nor greater than 8.5.
5. The 30-day average daily dry weather discharge flow shall not exceed 5.0 million gallons.

WASTE DISCHARGE REQUIREMENTS
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-4-

6. The Discharger shall use the best practicable cost-effective control technique currently available to limit mineralization to no more than a reasonable increment.
7. Survival of test fishes in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%

Median for any three or more bioassays - - - - - 90%

8. By-pass or overflow of untreated or partially treated waste is prohibited.

B. Discharge Specifications, Golf Course Irrigation:

1. The discharge shall remain within the designated disposal area at all times.
2. Reclaimed wastewater used for irrigation shall be managed to minimize erosion, runoff, and movement of aerosols from the irrigated area.
3. The Discharger may not irrigate effluent during periods of precipitation or for at least 24 hours after cessation of precipitation.
4. Irrigation of the golf course with reclaimed wastewater shall be allowed only when golfers are not present.
5. A 100-foot buffer area shall be maintained around areas of the golf course used for irrigation with reclaimed wastewater, and between any watercourse and the wetted area produced during spray disposal.
6. Signs alerting the public to the use of reclaimed wastewater shall be placed around the perimeter of all areas used for irrigation.

C. Sludge Disposal:

1. The Discharger shall comply with all existing Federal (40 CFR 257) and State laws and regulations (CCR, Title 23, Subchapter 15, Section 2510, et seq.) that apply to collected screenings, sludges, and other solids removed from liquid waste use and disposal practice(s), and with the Clean Water Act (CWA), Section 405 (d), technical standards when promulgated.
2. The Discharger shall give prior notice to the Board of any change(s) planned in sludge use or disposal practices.
3. The Discharger shall submit a final report on evaluation of all sludge disposal alternatives by 1 June 1991.

WASTE DISCHARGE REQUIREMENTS
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-5-

4. The Discharger shall submit a sludge management plan (if land application is the recommended alternative) by 2 August 1991 for approval by the Executive Officer.
5. The Discharger shall implement the approved sludge management disposal alternative by 1 October 1991.

D. Industrial Waste Requirements:

1. The discharge of fuels, lubricants, solvents, heavy metals, or other toxic materials into the sanitary sewer system in concentrations which adversely impact wastewater treatment plant operations or degrade treatment plant effluent quality is prohibited.
2. Base personnel shall be adequately trained in the proper handling, disposal, and cleanup of toxic materials to minimize the discharge of toxic materials to the sanitary sewer system.
3. The Discharger shall submit annually, by 31 January, a report summarizing the Discharger's industrial waste control activities conducted during the previous 12 months. The report shall include at a minimum:
 - a. A summary of operation and maintenance performed on oil/water separators;
 - b. Efforts to locate and regulate additional discharges of toxic materials to the sewage collection system;
 - c. Activities to educate Base personnel in proper handling and disposal of toxic materials; and
 - d. Toxic materials spills entering the collection system, their impacts on the treatment system, efforts to locate the source, and any corrective actions taken.

E. Receiving Water Limitations:

1. The discharge shall not cause the dissolved oxygen concentration in Hutchinson Creek to fall below 5.0 mg/l.
2. The discharge shall not cause visible oil, grease, scum, foam, floating or suspended material in the receiving waters or watercourses.
3. The discharge shall not cause concentrations of any materials in the receiving waters which are deleterious to human, animal, aquatic, or plant life.
4. The discharge shall not cause esthetically undesirable discoloration of the receiving waters.

WASTE DISCHARGE REQUIREMENTS
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-6-

5. The discharge shall not cause fungus, slimes, or other objectionable growths in the receiving waters.
6. The discharge shall not cause bottom deposits in the receiving waters.
7. The discharge shall not alter the normal ambient pH of the receiving water more than 0.5 units.
8. The discharge shall not increase the normal ambient temperature of the receiving water more than 5°F.
9. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

F. Provisions:

1. The Discharger shall implement an effluent toxicity monitoring program in accordance with procedures outlined in EPA 600/4-85-014 *Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Water to Freshwater Organisms* and EPA 440/4-85-032 *Technical Support Document for Water Quality-Based Toxics Control* to ensure that their discharge does not produce instream toxicity. The Discharger shall carry-out the biotoxicity monitoring program in accordance with the following schedule:
 - a. By 1 July 1991, a report on your progress toward development and implementation of the required effluent toxicity monitoring program shall be submitted.
 - b. By 1 October 1991, the proposed program shall be submitted to the Board for approval.
 - c. By 1 January 1992, the Discharger shall implement the approved biotoxicity monitoring program.
 - d. The Discharger shall submit the results of the biotoxicity monitoring program to the Board in accordance with the program schedule.

If the discharge produces instream toxicity, the Discharger shall conduct an investigation and develop a corrective action plan.

2. Neither the discharge nor its treatment shall create a nuisance or pollution as defined in Section 13050 of the California Water Code.

WASTE DISCHARGE REQUIREMENTS
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-7-

3. Reclaimed wastewater shall meet the criteria contained in Title 22, Division 4, California Code of Regulations (CCR) (Section 60301, et seq.).
4. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements (NPDES)", dated 1 October 1990, which are part of this Order.
5. The Discharger may be required to submit technical reports as directed by the Executive Officer.
6. The Discharger shall comply with the attached Monitoring and Reporting Program No. _____.
7. The Discharger shall provide adequate notice to the Regional Board of:
 - a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants.
 - b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

8. This Order expires on _____ and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.
9. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on _____.

WILLIAM H. CROOKS, Executive Officer

2/8/91:RJB:gs

Attachments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO.

NPDES NO. CA0110299

FOR
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

Specific sample station locations shall be established under direction of the Board's staff, and a description of the stations shall be attached to this Order.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. The following shall constitute the influent monitoring program:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
20°C BOD ₅	mg/l, lbs/day	24-hr. Composite	Weekly
Suspended Solids	mg/l, lbs/day	24-hr. Composite	Weekly

EFFLUENT MONITORING (001, 002)

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples should be representative of the volume and nature of the discharge. Time of collection of a grab sample shall be recorded. The following shall constitute the effluent monitoring program:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
20°C BOD ₅	mg/l, lbs/day	24-hr. Composite	Weekly
Suspended Matter	mg/l, lbs/day	24-hr. Composite	Weekly
Settleable Matter	ml/l	Grab	Daily
pH	pH Units	Grab	Daily
Chlorine Residual	mg/l	Grab	Daily
Total Coliform Organisms	MPN/100 ml	Grab	Twice Weekly*
Flow	mgd	Cumulative	Daily**
Total Petroleum Hydrocarbons (Gasoline Range)	mg/l	Grab	Monthly

MONITORING AND REPORTING PROGRAM
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-2-

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Total Petroleum Hydrocarbons (Motor Oil Range)	mg/l	Grab	Monthly
Total Petroleum Hydrocarbons (Diesel Range)	mg/l	Grab	Monthly
MBAS	mg/l	Grab	Monthly
Oil and Grease	mg/l	Grab	Monthly
Ammonia	mg/l	Grab	Monthly
Total Copper	mg/l	Grab	Semi-Annually
Total Barium	mg/l	Grab	Semi-Annually
Hexavalent Chromium	mg/l	Grab	Semi-Annually
Total Lead	mg/l	Grab	Semi-Annually
Total Cadmium	mg/l	Grab	Semi-Annually
Total Mercury	mg/l	Grab	Semi-Annually
Total Silver	mg/l	Grab	Semi-Annually
Boron	mg/l	Grab	Monthly
Total Cyanide	mg/l	Grab	Monthly
96-Hour Static Bioassay	%Survival	Grab	Quarterly

* Coliform testing shall be conducted on surface water discharge unless 100% of the flow is going to the golf course; at such time the golf course discharge shall be monitored.

** For both surface water discharge as well as golf course discharge.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water samples shall be taken from the following:

<u>Station</u>	<u>Description</u>
R-1	400 feet upstream from the point of discharge
R-2	1000 feet downstream from the point of discharge

MONITORING AND REPORTING PROGRAM
U. S. AIR FORCE - BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-3-

<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Dissolved Oxygen	mg/l	R-1, R-2	Weekly
pH	pH Units	R-1, R-2	Weekly
Temperature	°F	R-1, R-2	Weekly

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2. Attention shall be given to the presence or absence of:

- a. Floating or suspended matter
- b. Discoloration
- c. Bottom deposits
- d. Aquatic life

Notes on receiving water conditions shall be summarized in the monitoring report.

REPORTING

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly the compliance with waste discharge requirements.

Monthly monitoring reports shall be submitted to the Regional Board by the 15th day of the following month.

The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Board.

Upon written request of the Board, the Discharger shall submit a report to the Board by 30 January of each year. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

The Discharger shall implement the above monitoring program on the effective date of this Order.

Ordered by _____

WILLIAM H. CROOKS, Executive Officer

INFORMATION SHEET

U. S. AIR FORCE
BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

The Beale Air Force main wastewater treatment plant consists of pretreatment (oil-water separators), primary clarification, two trickling filters, a single secondary clarifier, and chlorination. Primary and secondary sludge is anaerobically digested and discharged to underdrained drying beds. Effluent is discharged to an aerated holding pond, which also serves as a dechlorination system, from which it either gravity flows to Hutchinson Creek (001) or is pumped to the Base golf course for irrigation (002). Golf course irrigation is the priority use of the effluent, so there is often very little or no discharge to the creek during the summer. Hutchinson Creek flows seasonally in this area and is often dry upstream of the Beale discharge. The design flow of the plant is 5.0 mgd, with a current dry weather flow of 0.7 mgd.

The plant has consistently complied with effluent limitations except for exceedences of their boron and cyanide limits that were imposed in 1986 because the Base began discharging its treated photo laboratory waste to the wastewater treatment plant. This was done because it was deemed no longer acceptable to use their underground injection wells for disposal of the photo waste. The Base is currently under Cease and Desist Order (CDO) No. 90-291, due to these violations; however, as of 19 October 1990, the photo laboratory ceased all waste discharge to the treatment facilities. The photo waste is now treated entirely with a closed loop recycling/evaporative treatment system. Samples taken by staff have indicated that cyanide and boron levels are in compliance with effluent limits; however, the Discharger's monitoring is still indicating violations of boron limits, but not cyanide (however, in the past, cyanide exceedences have been indicated when staff samples have not detected cyanide in the discharge). Under CDO No. 90-291, the Discharger will be splitting samples with a State certified independent laboratory, due to discrepancies in the monitoring results. Boron and cyanide monitoring will be required until these discrepancies can be eliminated and CDO No. 90-291 can be lifted based on total long-term compliance.

In addition to treating all of the Base's sanitary waste, a small amount of cooling tower blowdown is processed, as well as discharges from 27 oil-water separators which drain Base industrial areas such as truck maintenance yards, aircraft hangar areas, and fuel loading areas. And finally, a large aircraft wash rack discharges through a large oil-water separator to the wastewater treatment plant. No solvents are used in the aircraft washing operations, only biodegradable detergents.

Effluent limitations are proposed as follows:

1. BOD, suspended solids, and settleable matter in accordance with 40 CFR 133.102(a)(b) (unchanged).
2. Total Coliform limitations based upon California Department of Health Services' Wastewater Reclamation Criteria, Title 22, Division 4, California Code of Regulations (unchanged).

INFORMATION SHEET
U. S. AIR FORCE
BEALE AIR FORCE BASE
WASTEWATER TREATMENT PLANT
YUBA COUNTY

-2-

3. Total Cadmium, Lead, Chromium, Barium, Mercury, and Silver limitations are EPA Primary Drinking Water Standards (unchanged).
4. Total Cyanide limitation is the recommended safe level for chronic exposure of freshwater aquatic life, EPA *Ambient Water Quality Criteria* (unchanged).
5. The Boron limitation eliminates the possibility of damage to crops from Boron in irrigation uses (unchanged).
6. The Oil and Grease limitation was set to protect beneficial uses based on limited recreational use and no domestic use of the receiving waters (unchanged).
7. The Chlorine Residual limitation is based upon a recommendation by the California Department of Fish and Game, (changed from receiving water limitation to effluent limitation).
8. The MBAS limitation is a California Department of Health Services' Secondary Drinking Water Standard (new limitation).
9. The Total Petroleum Hydrocarbon (Diesel Range) limitation is an EPA Suggested No-Adverse-Response level.

2/8/91:RJB:gs

